WILD M680

Operating microscope

Service manual

Technical description and fault finding

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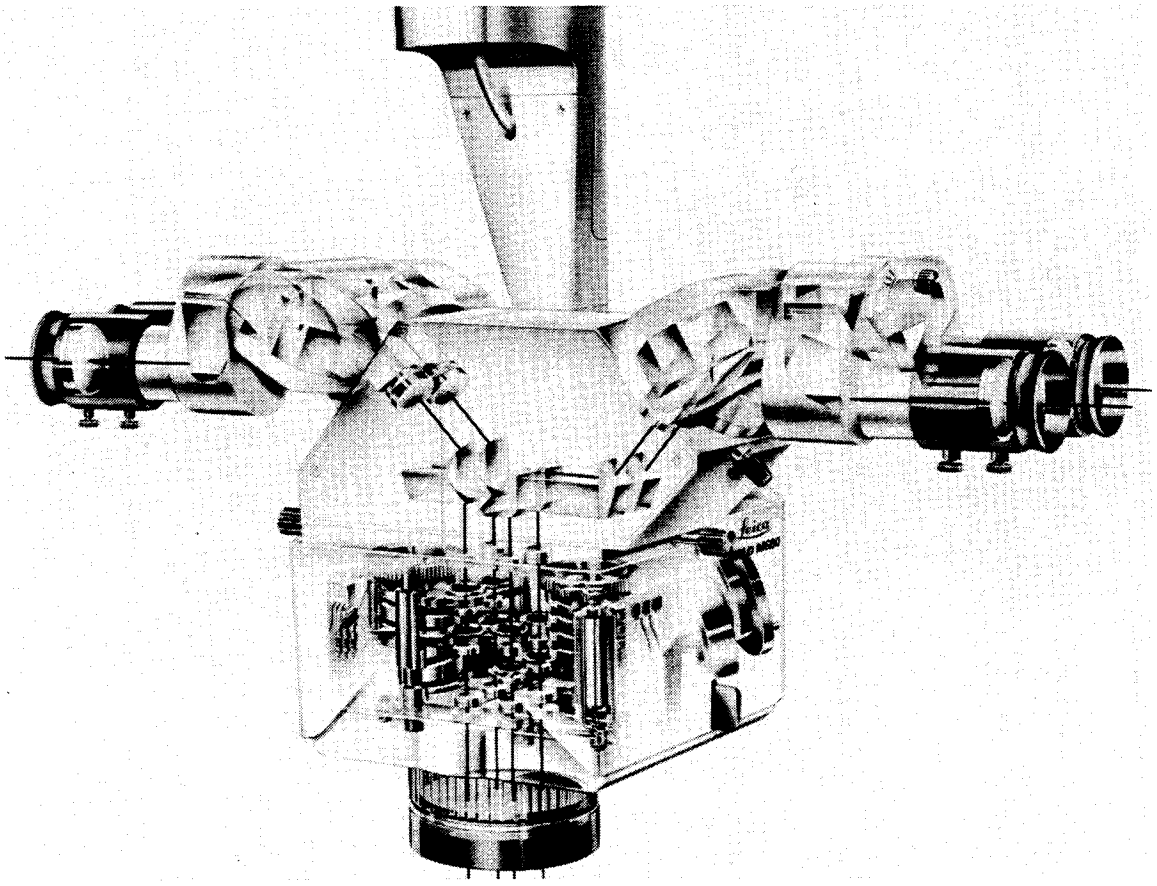

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Service Manual

WILD M680

Operating microscope

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Preconditions for using this service manual

Intended users

Technical personnel provided by customer or by LEICA agencies, equipped with testset article nbr. 566 152.

What is expected of the person using the Testset?

Stage 1: Allocation of a fault to one of the main groups:

- ***Footswitch***
- ***Control unit***
- ***Swingarm***
- ***Microscope (optics carrier)***
- ***X- or Y-gear***

- You have read the user manual and can operate the surgical microscope

Directions are given in Sections 3 and 4.

Stage 2: Locating and eliminating errors at module level

- You have been trained in the basics of electronics and mechanical engineering
- You have been instructed by a technician from your agency or from LEICA AG, HEERBRUGG.

Sections 3, 4 and 10

Stage 3: Locating and eliminating errors at board level

- You have been trained in the basics of electronics and mechanical engineering
- You have taken part in an M690/M695- or M680 course.

Sections 3 to 9, and Section 11

To the contents of service manual

Legal aspects

This book may only be given to, and used by, certain persons. These are detailed in **Section 1.**

Changes/ Service News

Place Service News on top of the M680 in **Section 2.**

Introduction/ User manual

CONGRATULATIONS - You are one of those methodical people who also read the important **Section 3** of this manual.

Locating faults with the test set (Test box)

If a fault develops, we will guide you to it with the assistance of **Section 4** and the test box.

The test set helps you to assign the fault to the:

- Footswitch
- Control unit
- Swingarm
- Microscope
- X- or Y-gear

The search is then continued at board level with the assistance of block diagrams and the wiring diagram.

Control unit MEL61/62
Description of function

The function description in **Section 5**, in conjunction with the wiring diagram, will lead you to the defective board or cable connection. The swingarm is the interface.

Swingarm
Description of function

The function description in **Section 6**, in conjunction with the wiring diagram, will lead you to the defective board or cable connection. The swingarm is the interface.

M680 microscope
Description of function

The function description in **Section 7**, in conjunction with the wiring diagram, will lead you to the defective board or cable connection. The swingarm is the interface.

XY-gear
Description of function

The function description in **Section 8**, in conjunction with the wiring diagram, will lead you to the defective board or cable connection. The swingarm is the interface.

Wiring diagram

Section 9 contains the wiring diagram, and a description of the positions of the boards and the plug connections.

Exchanging modules

Section 10 includes instructions for exchanging those modules which are available as spare parts.

Exchanging boards

Section 11 includes instructions for exchanging those boards which are available as spare parts.

Testing procedure

After modules or boards have been replaced, the instrument must meet specifications. Values and tolerances are laid down in the testing procedure in **Section 12.**

Test set

The test box and service cable, and their circuits, are described in **Section 18.**

Spare parts

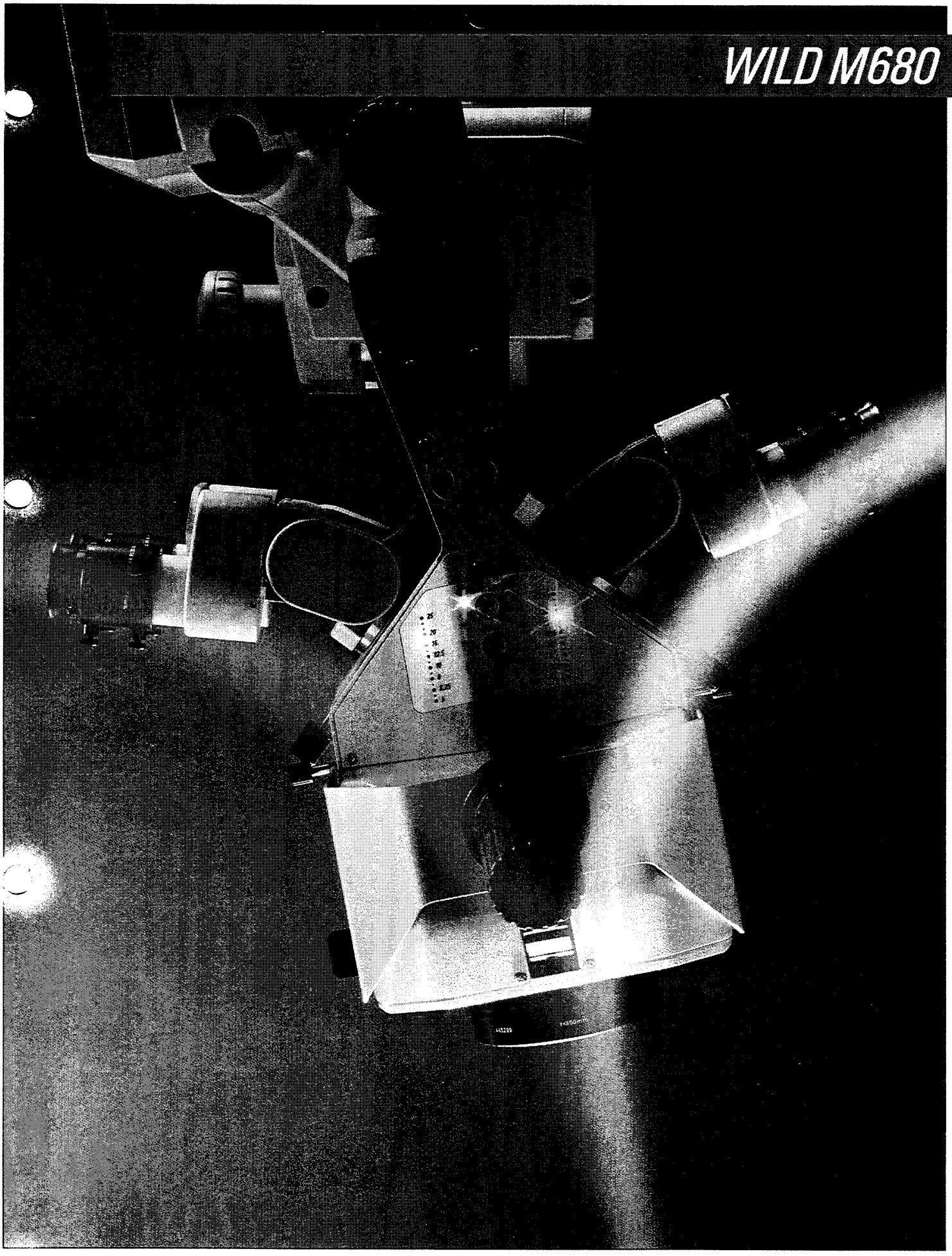
The spare parts, the exchange of which is described in Sections 10 and 11, are listed in **Section 19**.

Special tools

Section 20 includes a list of the service equipment which will enable you to carry out the operations described above.

No special tools are required. The components making up the test box include a service handswitch and a service cable which serves to bridge the swingarm.

WILD M680



User manual • Mode d'emploi
Bedienungsanleitung • Manual de empleo

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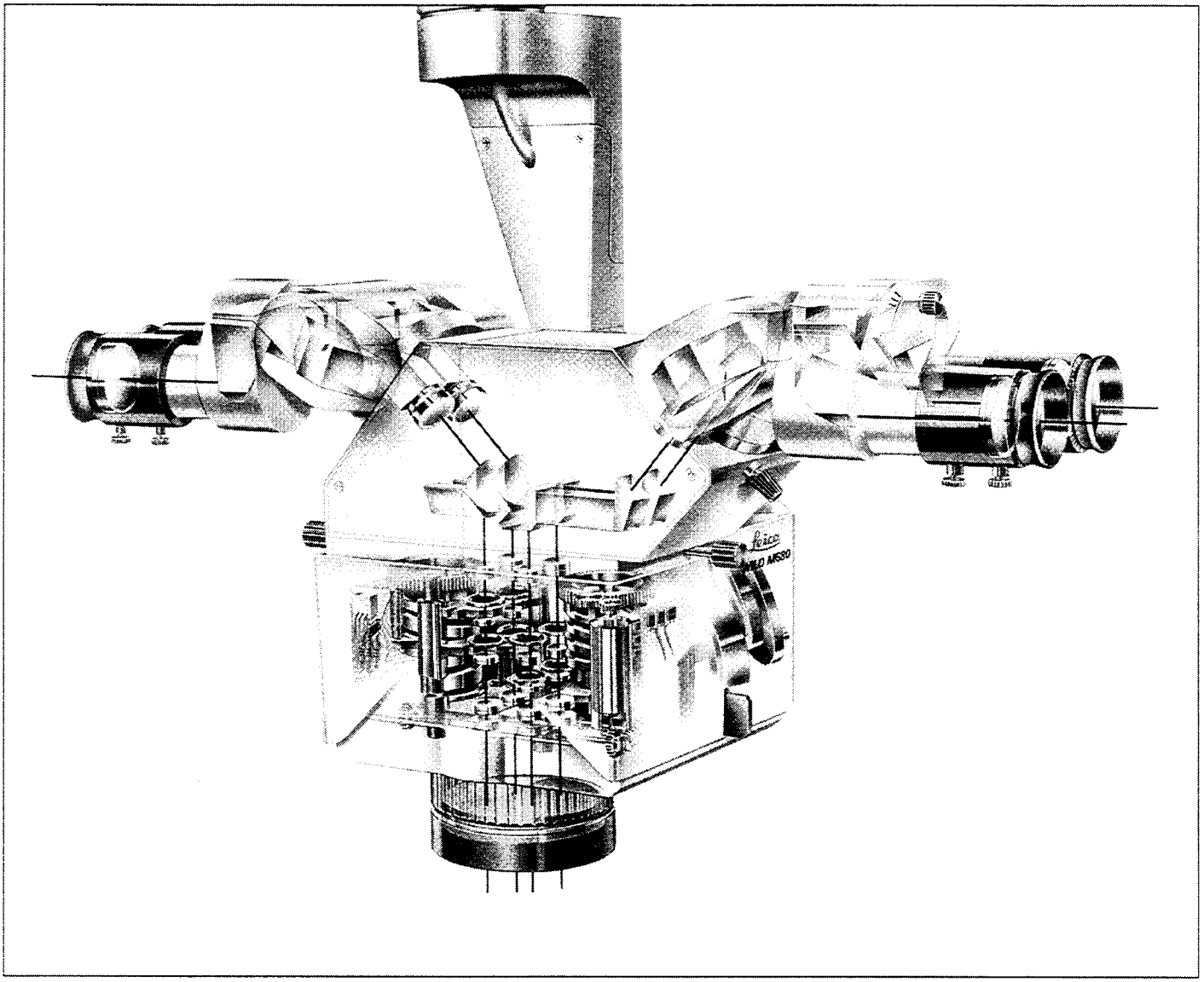
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WILD MS30

To you, the user

Thank you for your attention. We wish you success and satisfaction in your future work with this surgical microscope.

We are proud to introduce our WILD M680 surgical microscope. This high-technology instrument, a completely new concept, was developed for two-surgeon operations in reconstructive, orthopaedic, heart and spinal surgery, and also in urology and gynaecology. The two independent zooms and the two independent internal focusing systems create ideal conditions for coperation between surgeon and assistant.

You will only get the best out of the WILD M680 if you take the trouble to study this user manual in detail. Practice the various movements until they have become routine. When you and your surgical microscope are fully prepared, you will convert the advantages of the instrument into advantages for your patients.

If you still have a question sometime, just contact your local Leica agency or write to Leica AG* in Heerbrugg, Switzerland. We are gladly at your disposal. Customer service is a big thing with us. Not only before the sale, but afterwards as well.

** Leica AG, Heerbrugg, Switzerland, has been certified as being equipped with a quality system which meets the International Standard of Quality Management and Quality Systems (ISO standard 9001).*

Cher utilisateur

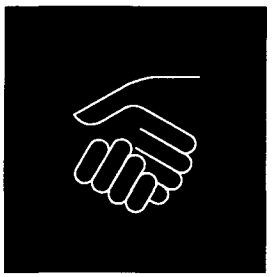
Nous souhaitons que ce microscope d'opération vous apporte entière satisfaction et vous remercions de votre attention.

Les composants de mécanique fine, optiques et électroniques font du WILD M680 un instrument compact de haute technologie. Une technique fascinante qui répond largement aux besoins de la médecine. Doté de 2 zooms et de 2 systèmes de mise au point indépendants ainsi que de modules d'observation individuels, le M680 est un instrument qui offre des conditions de travail idéales au chirurgien et à son assistant et facilite ainsi le travail d'équipe. Bien entendu, le WILD M680 s'utilise aussi comme un microscope d'opération normal. Il suffit de presser un bouton pour coupler les deux zooms indépendants, ce qui n'influe aucunement sur la mise au point dont le réglage reste individuel. Le WILD M680, un instrument novateur offrant de nouvelles possibilités pour la chirurgie restauratrice, cardiaque, de la main, du dos, pour l'urologie et la gynécologie.

Le microscope devant être réglé et contrôlé minutieusement avant l'opération, il est important d'étudier attentivement le présent mode d'emploi. Celui-ci vous permettra de parfaitement connaître les fonctions du WILD M680 et d'exploiter pleinement ses avantages.

Pour toute question complémentaire, veuillez vous adresser à votre représentation Leica ou directement à Leica AG* Heerbrugg en Suisse. Nous nous tenons entièrement à votre disposition.

** Leica Heerbrugg détient la certification ISO 9001.*



Liebe Benutzerin Lieber Benutzer

Wir danken Ihnen für Ihre Aufmerksamkeit und wünschen Ihnen viel Erfolg mit Ihrem wertvollen Operationsmikroksop.

Mit einem bisher einzigartigen konstruktiven Aufwand wurden beim WILD M680 feinmechanische, optische und elektronische Komponenten zu einem kompakten "High-Tech-Instrument" verdichtet. Zwei unabhängige Zooms, zwei unabhängige interne Fokussysteme und individuell wählbare Beobachtungsmodule schaffen ideale Bedingungen für die Zusammenarbeit von Chirurg und Assistent. Eine bessere und zeitsparende Teamarbeit ist die Folge. Mit dem WILD M680 ergeben sich neue Möglichkeiten für die Plastisch-Rekonstruktive Chirurgie, Handchirurgie, Wirbelsäulenchirurgie, Urologie, Gynäkologie und Herzchirurgie.

Damit Sie die Vorteile des WILD M680 kennen und optimal nutzen können, lesen Sie bitte die vorliegende Bedienungsanleitung. Nehmen Sie sich die Zeit und lernen Sie das WILD M680 genau kennen. Trainieren Sie seine Funktionen, bis sie zur Routine geworden sind. Wenn Sie und das Operationsmikroskop optimal vorbereitet sind, werden sich die Vorteile des Operationsmikroskops in Vorteile für Ihre Patienten umwandeln.

Und falls Sie einmal Fragen haben, wenden Sie sich bitte an Ihren Leica-Vertreter oder an Leica AG*, Heerbrugg, Schweiz.
Wir helfen Ihnen gern. Denn KUNDENDIENST wird bei uns gross geschrieben. Vor und nach dem Kauf.

** Leica Heerbrugg wurde das Internationale Qualitätszertifikat nach der Norm ISO 9001 erteilt.*

Estimado usuario

Le agradecemos por su atención y le deseamos mucho éxito con su nuevo microscopio de operación.

El WILD M680 aúna componentes ópticos, electrónicos y mecánicos de precisión que le convierten en un instrumento de tecnología punta. Dos zooms y dos sistemas de enfoque incorporados independientes, así como módulos de observación individualmente seleccionables ofrecen una serie de condiciones óptimas para el trabajo en común de cirujano y asistente, lo que se traduce en un eficaz y rápido trabajo en equipo. Con el WILD M680 se abren nuevas perspectivas en el campo de la cirugía plástica, la espinal, del corazón y de la mano, así como en la urología y la ginecología.

Ahora bien, para sacar el máximo rendimiento posible al instrumento, le recomendamos leer este manual con atención. Tómese el tiempo necesario para conocer a fondo su WILD M680. Ensaye las diversas funciones del aparato hasta que se conviertan en rutina, para que sus múltiples ventajas traigan los frutos apetecidos en el tratamiento del paciente.

Si una vez se le presentaran dificultades, no dude en ponerse en contacto con su representación local de Leica o bien con Leica AG, Suiza. Estamos a su plena disposición, pues damos una gran importancia a la asistencia al cliente, tanto antes como después de la compra.*

** Leica AG, Heerbrugg, Suiza, cuenta con el certificado de calidad internacional según la norma ISO 9001.*

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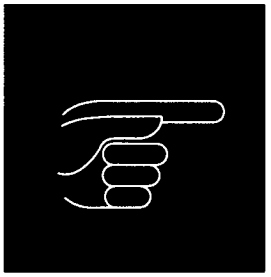

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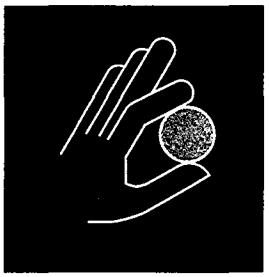

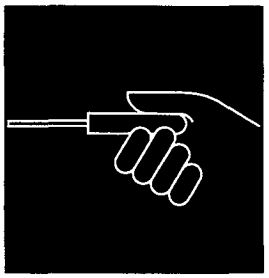

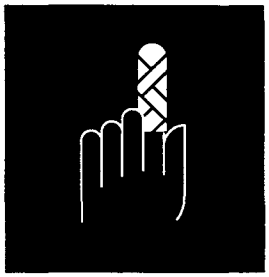

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- Monokularer Mitbeobachtertubus
- Stereo-Mitbeobachteransatz

38 **Dualansatz Photo/TV**
- Filterrevolver
- TV- und Photo-Formate

40 **TV-/Kino-Ansatz**

41 **Photoansatz**
Bildausschnitte

Montage/Aufbau
42 **Bodenstativ**
Montage Fuss bis Steuergerät

44 **Schwenkarm, Operationsmikroskop**
Mikroskopträger

45 **Fussschalter**
- Träger
- Reinigung

46 **Steuergerät**
- Anschlüsse
- Sicherungswechsel
- Fehlerlokalisierungssystem

48 **Stereo-Module**
Binokulartubus,
Objektiv, Okulare
Strichplatte einsetzen

49 **Glühlampen**

50 **Deckenstativ**

Hinweise
51 **Pflege**

52 **Hinweise zu Ihrer Sicherheit**

54 **Hinweise und Ratschläge**

57 **Wir garantieren für Qualität**

58 **Technische Daten**

59 **Optische Daten**

Elementos de mando esterilizables
32

Accesorios
33 **Tabla de pesos**

34 **Divisor de rayos**
- Montaje
- Montaje de accesorios
- Diafragma iris doble: ajuste de la **profundidad de campo**

36 **Observación simultánea**
- Tubo monocular para segundo observador
- Dispositivo estereoscópico de observación simultánea

38 **Suplemento dual para fotografía y TV**
- Revólver para filtros
- Formatos de TV y fotografía

40 **Suplemento de cámara de cine/TV**

41 **Suplemento de cámara fotográfica**
Encuadres

Montaje
42 **Estativo de suelo**
Montaje del pie hasta aparato de mando

44 **Brazo móvil, microscopio de operación**
Portamicroscopio

45 **Dispositivo de control por pedal**
- Soporte
- Limpieza

46 **Aparato de mando**
- Conexiones eléctricas
- Sustitución de fusibles
- Sistema de localización de errores

48 **Módulos estereoscópicos, Tubo binocular, Objetivo oculares**
Acoplado del retículo

49 **Bombillas**

50 **Estativo de techo**

Observaciones
51 **Mantenimiento**

52 **Observaciones para su seguridad**

54 **Observaciones y consejes**

57 **Respondemos de la calidad**

58 **Datos técnicos**

59 **Datos ópticos**

Overview

What does what: Functions on the surgical microscope

Vue d'ensemble

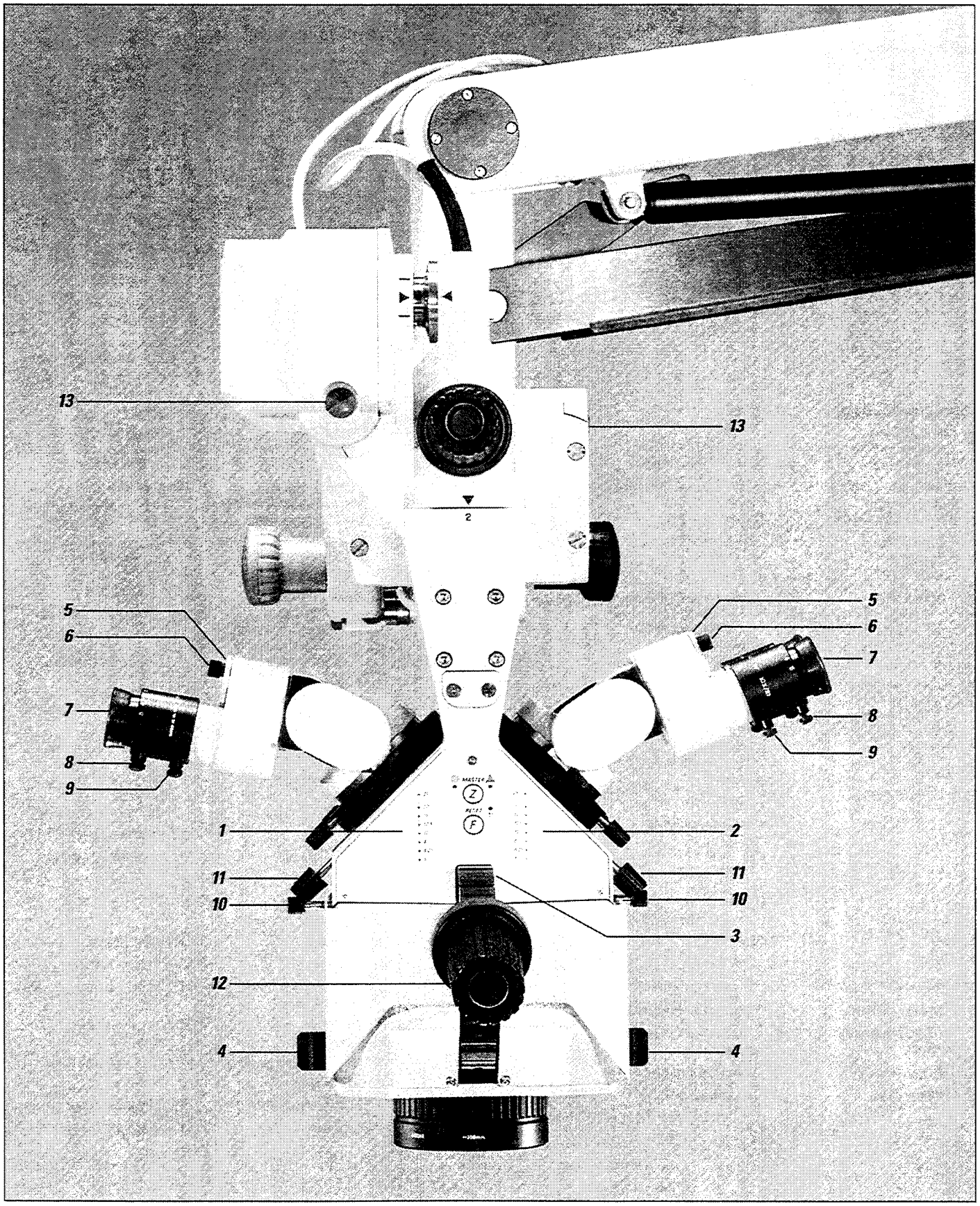
Eléments de commande du microscope d'opération

Übersicht

Was dient wofür: Funktionen am Operations-mikroskop

Visión general

Funciones del microscopio de operación



Keys

Z Switching of master functions

F Automatic setting of basic focus position

Signal lamps

● **(red) pilot lamp:** Surgeon ● (red) controls both zooms

▲ **(blue) pilot lamp:** Surgeon ▲ (blue) controls both zooms

warning lamp:
- The wheel with the bulbs is not correctly engaged
- Replace the bulb.

1 **Display of zoom ● (red)** Magnifications 5× to 25×

2 **Display of zoom ▲ (blue)** Magnifications 5× to 25×

Illumination

3 **Quick-change lamp mount:** There are two bulbs, in the wheel

4 **Filterholders** with VG9 green filters or KB12 daylight filters, interchangeable

Binocular tube

5 **Display of interpupillary distance**

6 **Clamping screw:** Secure interpupillary distance setting

7 **Wide-field eyepieces for spectacle wearers** with diopter setting adjustable from +5 to 5 and with eyecups

8 **Clamping screws:** Secure eyelens positions

9 **Securing screws:** Secure eyepieces in binocular tube

10 **Securing screws:** Secure stereo module to microscope

11 **Securing screws:** Secure binocular tube, intermediate tube or beam splitter, to stereo modules

12 **Handle**

13 **Manual XY control** If necessary, use the hexagonal key to perform X and Y movements

Touches

Z Commuter sur les fonctions Master

F Position de base automatique de l'objectif à mise au point

Affichage lumineux

● **(rouge) Lampe témoin:** Le chirurgien ● (rouge) commande les deux zooms.

▲ **(bleue) Lampe témoin:** Le chirurgien ▲ (bleue) commande les deux zooms.

Lampe d'avertissement:
- le disque sur lequel se trouvent les ampoules n'est pas engagé correctement
- l'ampoule doit être remplacée

1 **Fenêtre du zoom ● (rouge):** Grossissements 5× a 25×

2 **Fenêtre du zoom ▲ (bleue):** Grossissements 5× a 25×

Eclairage

3 **Changeur rapide d'ampoule:** Le disque contient deux ampoules.

4 **Porte-filtres** avec filtres verts VG9 ou lumière du jour KB12, interchangeables

Tube binoculaire

5 **Indicateur d'écartement pupillaire**

6 **Pince à vis:** pour fixer les tubes à l'écartement pupillaire requis.

7 **Oculaires grand-angulaires pour porteurs de lunettes** avec dioptries réglables de +5 à -5 et oeillères.

8 **Pinces à vis:** pour fixer la lentille d'oeil.

9 **Vis de fixation:** pour fixer les oculaires dans le tube binoculaire.

10 **Vis de fixation:** pour fixer les modules stéréo sur le microscope.

11 **Vis de fixation:** pour fixer le tube binoculaire, la bague intermédiaire tournante ou le répartiteur optique sur les modules stéréo.

12 **Poignée de positionnement**

13 **Comande XY manuelle** En cas d'urgence, effectuer les mouvements XY à l'aide de la clé à six pans.

MASTER

RESET

Drucktasten

Z Master-Funktionen umschalten.

F Automatische Fokus-Grundstellung.

Leuchtanzeigen

● **(rot) Kontrollampe:** Chirurg ● (rot) steuert beide Zooms.

▲ **(blau) Kontrollampe:** Chirurg ▲ (blau) steuert beide Zooms.

Warnlampe:
- Das Rad mit den Glühlampen ist nicht korrekt eingerastet.
- Glühlampe muss ersetzt werden.

1 **Anzeige Zoom ● (rot):** Vergrösserungen 5× bis 25×

2 **Anzeige Zoom ▲ (blau):** Vergrösserungen 5× bis 25×

Beleuchtung

3 **Lampenschnellwechsler:** Im Rad befinden sich zwei Glühlampen.

4 **Filterhalter** mit Grünfiltern VG9 oder Tageslichtfiltern KB12, auswechselbar.

Binokulartubus

5 **Augenabstands-Anzeige**

6 **Klemmschraube:** Augenabstand feststellen.

7 **Weitwinkel-Brillenträgerokulare** mit verstellbaren Dioptrien von +5 bis –5 und Augenmuscheln.

8 **Klemmschrauben:** Augenlinsen feststellen.

9 **Befestigungsschrauben:** Okulare im Binokulartubus befestigen.

10 **Befestigungsschrauben:** Stereo-Module auf dem Mikroskop befestigen.

11 **Befestigungsschrauben:** Binokulartubus, Tubuszwischenstück oder Strahlenteiler auf den Stereo-Modulen befestigen.

12 **Handgriff**

13 **Manuelle XY-Bedienung** Im Notfall XY-Bewegungen mit Imbussschlüssel ausführen.

Botones

Z Conmutar funciones Master.

F Posición básica de enfoque automática.

Indicaciones luminosas

● **(rojo) lámpara de control:** cirujano ● (rojo) controla ambos zooms.

▲ **(azul) lámpara de control:** cirujano ▲ (azul) controla ambos zooms.

Lámpara de aviso:
- el disco con las bombillas no está correctamente encajado.
- debe sustituirse la bombilla.

1 **Indicación zoom ● (rojo):** aumentos de 5× a 25×

2 **Indicación zoom ▲ (azul):** aumentos de 5× a 25×

Iluminación

3 **Cambiador rápido de bombillas:** en el disco se encuentran dos bombillas.

4 **Corredera para filtros** con filtros verdes VG9 o filtros para luz natural KB12, intercambiables.

Tubo binocular

5 **Indicador de la distancia interpupilar**

6 **Tornillo de ajuste:** para ajustar la distancia interpupilar.

7 **Oculares granangulares para observar con gafas** con dioptrías ajustables de +5 a –5 y anteojeras.

8 **Tornillos de apriete:** para fijar las lentes oculares.

9 **Tornillos de apriete:** para fijar los oculares en el tubo binocular.

10 **Tornillos de apriete:** para fijar los módulos estereoscópicos en el microscopio.

11 **Tornillos de apriete:** para fijar el tubo binocular, la pieza intermedia giratoria o el divisor de rayos en los módulos estereoscópicos.

12 **Empuñadura**

13 **Manejo manual de XY** en caso necesario lleve a cabo los movimientos XY mediante la llave Allen.

Overview

What does what: Functions on the stand

Vue d'ensemble

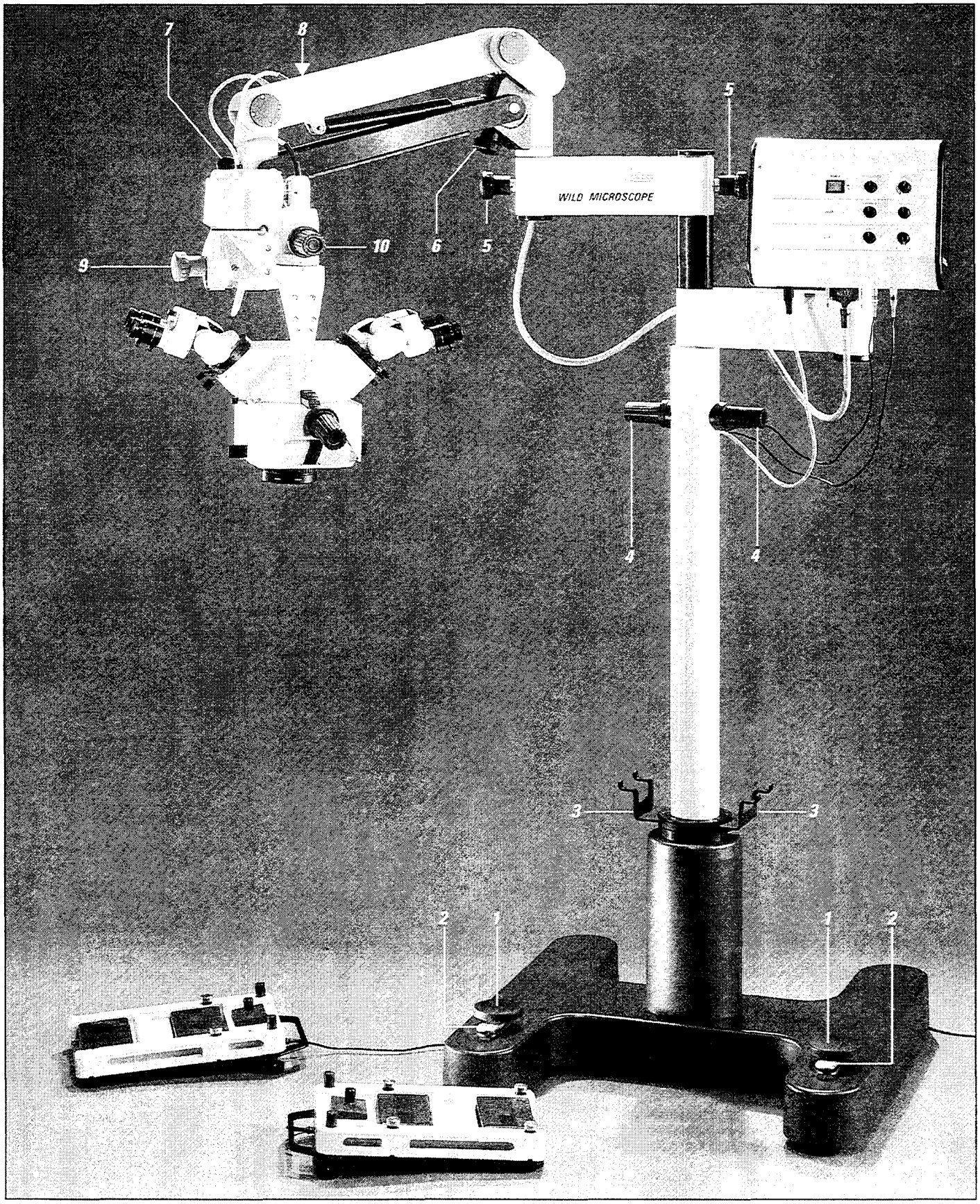
Eléments de commande du statif

Übersicht

Was dient wofür: Funktionen am Stativ

Visión general

Funciones del estativo



1 **Footbrakes** block the stand

2 **Footbrake levers** release the footbrakes

3 **Carrier** for two footswitches

4 **Handles** displace the stand

5 **Articulation brakes** adjust the ease of the rotary movements on the swingarm

6 **Weight compensation** balances the swingarm when accessories are changed

7 **Safety hook** blocks the swingarm Picture: Swingarm freely movable (released safety hook captured by retaining mechanism)

8 **Retaining mechanism** Picture: Holds safety hook when latter has been released

9 **Perforated-disc linkage** This connects the stand to the microscope carrier system. The orange knob holds the microscope carrier on to the perforated disc

10 **Brake knobs for articulation** These hold the microscope in the basic position required

Refer to page 46 for electrical connections

1 **Pédales de frein** pour bloquer le statif

2 **Levier** pour desserrer les freins du pied du statif

3 **Support** pour 2 commandes à pédale

4 **Poignées** pour déplacer le statif

5 **Boutons de freinage** pour régler le degré de dureté des mouvements du bras mobile

6 **Contrepoids** pour équilibrer le bras mobile après un changement d'accessoires.

7 **Crochet de retenue** pour bloquer le bras mobile. Illustration: bras libre (crochet libéré et goujon d'encliquetage engagé).

8 **Goujon d'encliquetage** pour caler le crochet en position de repos.

9 **Joint de sécurité** entre le statif et le porte-microscope, ce dernier étant maintenu dans le disque perforé a l'aide du bouton orange.

10 **Bouton de freinage** pour maintenir le microscope dans la position de base requise.

Connexions électriques, voir p. 46

1 **Fussbremsen** Stativ arretieren.

2 **Fusshebel** Fussbremsen lösen.

3 **Träger** für 2 Fussschalter.

4 **Griffe** Stativ verschieben.

5 **Gelenkbremsen** Gangleichtigkeit der Drehbewegungen am Schwenkarm regulieren.

6 **Gewichtsausgleich** Bei Zubehörwechsel Schwenkarm ins Gleichgewicht bringen.

7 **Sperrhaken** Schwenkarm blockieren. Im Bild: Schwenkarm frei beweglich (Sperrhaken gelöst und im Haltebolzen festgeklinkt).

8 **Haltebolzen** hält den Sperrhaken wie im Bild in gelöstem Zustand.

9 **Sicherheitsverbindung** verbindet das Stativ mit dem Mikroskopträgersystem. Der orange Klemmknopf hält den Träger in der Lochscheibe.

10 **Gelenkbremse** hält das Mikroskop in der gewünschten Grundposition.

Elektrische Anschlüsse und Verbindungen siehe S. 46.

1 **Frenos de pie** para retener el estativo.

2 **Palanca de pie** para soltar los frenos de pie.

3 **Soportes** para dos dispositivos de control por pedal.

4 **Mangos** para desplazar el estativo.

5 **Frenos de articulación** para regular la suavidad de los movimientos del brazo móvil.

6 **Compensación del peso** mantiene equilibrado el brazo móvil después de cada sustitución de accesorio.

7 **Gancho de bloqueo** para inmovilizar el brazo móvil. En la imagen: brazo móvil libre (gancho de bloqueo suelto y encajado en el perno de sujeción).

8 **Perno de sujeción** en este caso impide que el gancho de bloqueo se agarre y por ende se bloquee el brazo móvil.

9 **Conexión de seguridad** conecta el estativo con el sistema del portamicroscopio. El botón de retención anaranjado asegura el brazo horizontal en el disco perforado.

10 **Freno de articulación** retiene el microscopio en la posición básica elegida.

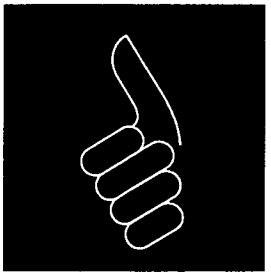
Conexiones eléctricas, véase pág. 46

What does what:

Functions on the control unit, footswitch and handswitch

Vue d'ensemble

Eléments du bloc de commande et des commandes à pédale/manuelle

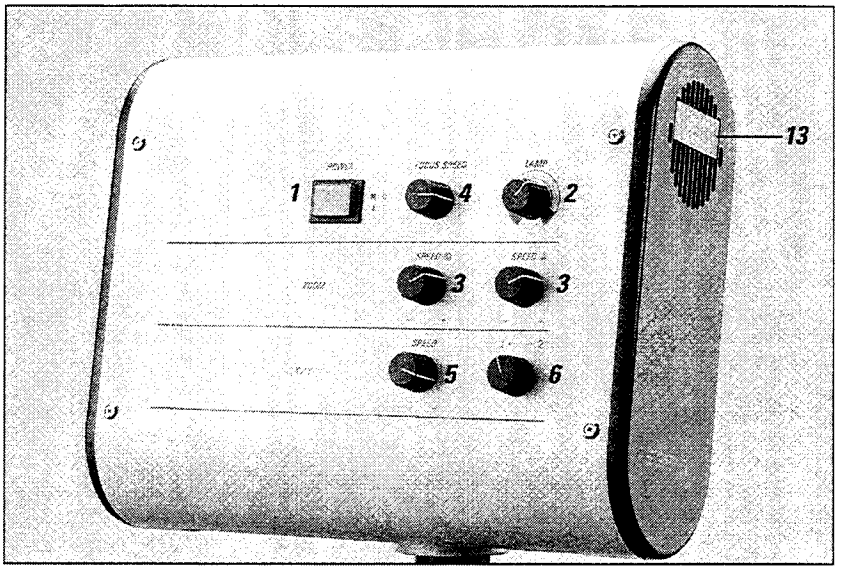


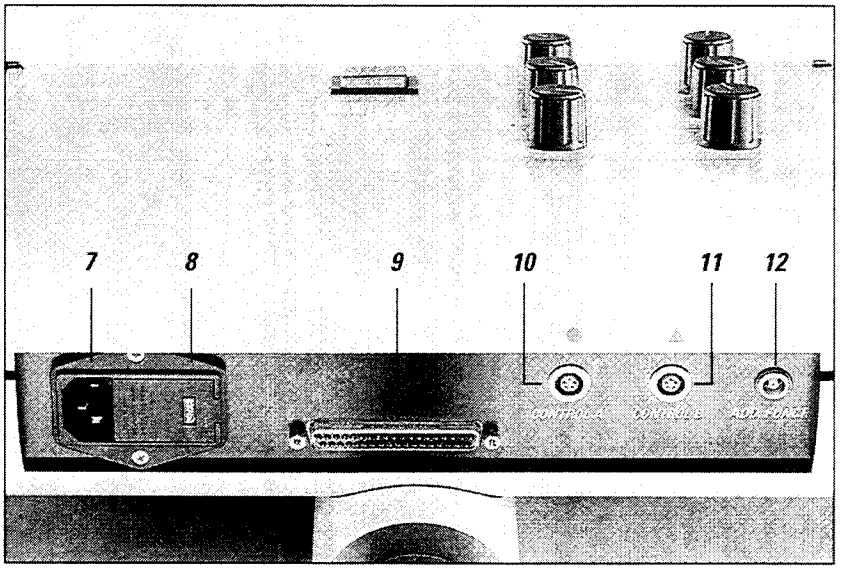
Übersicht

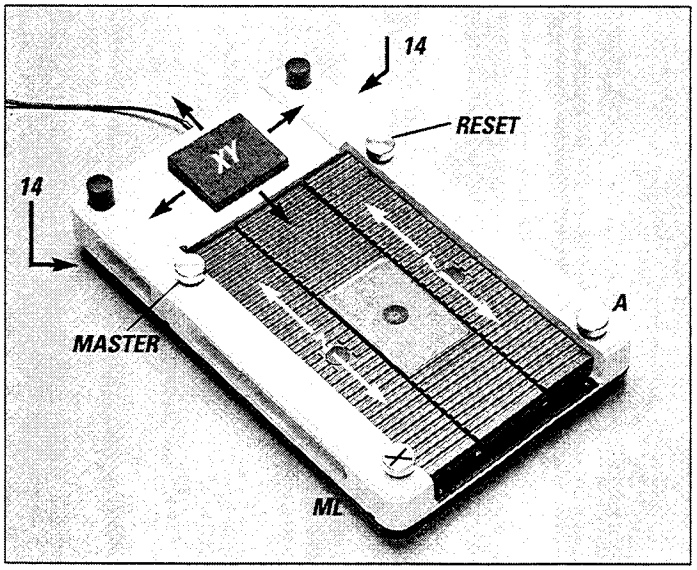
Was dient wofür: Funktionen am Steuergerät, Fuss-/ Handschalter

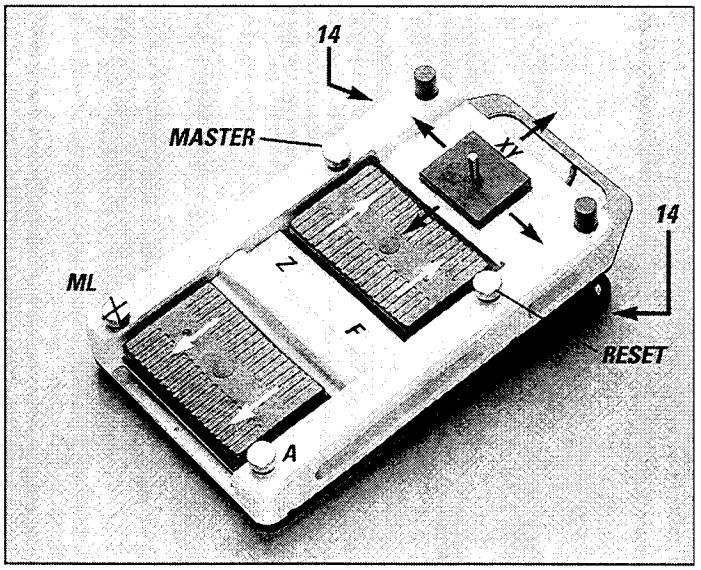
Visión general

Funciones del aparato de mando, dispositivo de control por pedal/manual









Control unit

1 **Power switch**

2 **Regulating knob** governs the brightness

3 **Regulating knobs** Zoom speed ● (red) and zoom speed ▲ (blue)

4 **Regulating knob** governs the focus speed

5 **Regulating knob** governs the XY speed

6 **Selector knob** rearranges footswitch functions when microscope is turned

7 **Socket** for power cable

8 **Voltage selector and fuse holder** sets wheel behind flap to 115V or 230V. Fuses 2×1,6AT, 250VA, 5×20mm

9 **Socket** for microscope cable

10 **Socket** for foot or handswitch, surgeon ● (red)

11 **Socket** for foot or handswitch, surgeon ▲ (blue)

12 **Socket** for attaching additional instrument

13 **Locating faults** If a fault develops, inspect the diodes.

Footswitch and handswitch

Z Zoom
F Focus
Z MASTER switches over master functions
F RESET automatically sets basic focus position
XY movements are controlled
A Additional function is switched on and off
ML No function
14 Adjustable footrest Rotate to change tilt of footswitch.

Bloc de commande

1 **Interrupteur principal**

2 **Bouton de réglage** de la luminosité

3 **Boutons de réglage** de la vitesse du zoom ● (rouge) et du zoom ▲ (bleue)

4 **Bouton de réglage** de la vitesse de mise point

5 **Bouton de réglage** de la vitesse des mouvements XY

6 **Sélecteur** de commutation des pédales lors d'un pivotement du microscope

7 **Connexion** pour le câble réseau

8 **Sélecteur de tension et porte-fusibles** Derrière la plaque, positionner le disque sur 115 V ou 230 V. Fusibles 2×1,6 AT, 250 VA, 5×20 mm

9 **Connexion** pour le câble du microscope

10 **Connexion** commande à pédale/manuelle pour chirurgien ● (rouge)

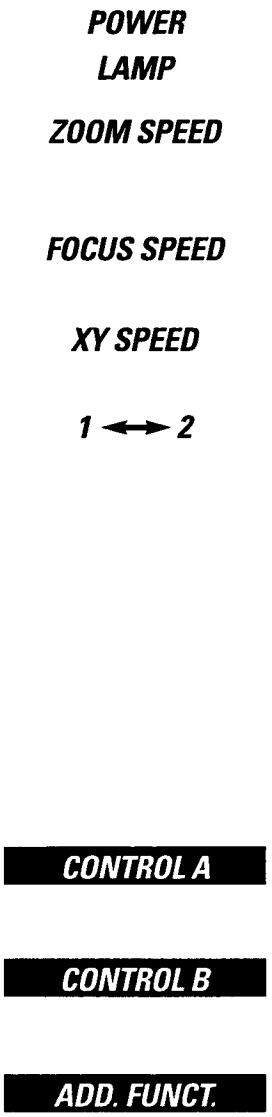
11 **Connexion** commande à pédale/manuelle pour chirurgien ▲ (bleue)

12 **Connexion** pour appareil supplémentaire

13 **Localisation des pannes** En cas de pannes, contrôler les diodes

Commandes à pédale/manuelle

Z Zoom
F Mise au point
Z MASTER Commuter sur les fonctions Master
F RESET Position de base automatique de la mise au point
XY Mouvements Guidage
A Fonction supplémentaire Activer et désactiver
ML Sans fonction
14 Repose-pieds à inclinaison réglable



Steuergerät

1 **Netzschalter**

2 **Regulierknopf** Helligkeit regulieren.

3 **Regulierknöpfe** Verstellgeschwindigkeiten Zoom ● (rot) und Zoom ▲ (blau) regulieren.

4 **Regulierknopf** Verstellgeschwindigkeit Fokus regulieren.

5 **Regulierknopf** Verstellgeschwindigkeit XY-Bewegungen regulieren.

6 **Selektorknopf** Zuordnung der Fussschalter bei Drehen des Mikroskops umschalten.

7 **Anschluss** Netzkabel anschliessen.

8 **Spannungswähler und Sicherungshalter** Rad hinter der Klappe auf 115 V oder 230 V stellen. Sicherungen 2×1,6AT, 250 VA, 5×20 mm.

9 **Anschluss** Mikroskopkabel anschliessen.

10 **Anschluss** Fuss-/Handschalter für Chirurg ● (rot) anschliessen.

11 **Anschluss** Fuss-/Handschalter für Chirurg ▲ (blau) anschliessen.

12 **Anschluss** Zusatzgerät anschliessen.

13 **Fehlerlokalisierung** Im Störungsfall Dioden kontrollieren.

Fuss-/Handschalter

Z Zoom
F Fokus
Z MASTER Master-Funktionen umschalten.
F RESET Automatische Fokus-Grundstellung.
XY Bewegungen steuern
A Zusatzfunktion ein- und ausschalten
ML ohne Funktion
14 Verstellbare Fussstützen Durch Drehen Neigung des Fussschalters einstellen.

Aparato de mando

1 **Interruptor de red**

2 **Botón de regulación** para adaptar la intensidad luminosa.

3 **Botones de regulación** para regular las velocidades de ajuste del zoom ● (rojo) y el zoom ▲ (azul).

4 **Botón de regulación** para regular la velocidad de ajuste del enfoque.

5 **Botón de regulación** para regular la velocidad de ajuste de los movimientos XY.

6 **Botón de selección** para conmutar la disposición de los comandos del pedal cuando se gira el microscopio.

7 **Conexión** para cable de red.

8 **Selector de tensión y portafusibles** fijar el disco detrás de la tapa a 115 ó 230 V. Fusibles 2×1,6AT, 250 VA, 5×20 mm.

9 **Conexión** para cable de microscopio.

10 **Conexión** para dispositivo de control manual/por pedal, para cirujano ● (rojo).

11 **Conexión** para dispositivo de control manual/por pedal, para cirujano ▲ (azul).

12 **Conexión** para instrumento adicional.

13 **Localización de errores** En caso de avería, controle los diodos.

Dispositivo de control por pedal/manual

Z Zoom
F Enfoque
Z MASTER conmutación de funciones master.
F RESET posición básica automáticade enfoque.
XY Movimientos control de los movimientos XY
A Función adicional conectar/desconectar
ML sin función
14 Reposapiés ajustables gire para ajustar el grado de inclinación

Overview

Checklist: Settings before the operation

Eyepieces
- Screw on eyecups and, if appropriate, spacing rings, in accordance with user list (page 24)
- Photography: insert graticule (reticle) (page 49)
- Fold back eyecups if appropriate (refer to user list) (page 23).

Clean optical components
- Inspect cleanliness of eyepieces, objectives, photo and TV adapters
- Remove dust and dirt (page 51).

Equipping
- Release brakes (page 30)
- Unfold swingarm
- Tighten brakes
- Ensure that swingarm is blocked (page 28)
- Equip microscope ready for use with all necessary accessories (short or long stereo modules?).

Vue d'ensemble

Liste de contrôle: réglages préopératoires

Balancing
- Release safety hook (page 28)
- Balance swingarm (page 29).

Ease of movement
- Adjust articulation brakes in accordance with weight of accessories and with personal requirements (page 30).
- Engage safety hook: swingarm is blocked.

Connect foot or handswitch
Respect the correct arrangement:
- Foot-/handswitch ● (red) / surgeon ● (red)
- Foot-/handswitch ▲ (blue) / surgeon ▲ (blue).

Inspect all cables
and ensure that they are properly connected.

Übersicht

Checkliste: Einstellungen vor der Operation

Inspect functions
Control unit
Power switch on: zoom and focus automatically travel to basic positions (page 16).

Master function
Switch over if necessary, (page 15).

Illumination
Inspect and, if necessary, change bulb (page 25).

Functions
Use footswitches to activate zoom, focus and XY movement (pages 16-18).

Adjust speeds (page 19).

If your instrument does not function satisfactorily, inspect the lights on the side of the control unit before you contact your Leica agency (see also page 47).

Visión general

Lista de control: ajustes antes de la operación

The final touches
Positioning
- XY basic position (indices) (page 18)
- Switch off light and power switch (page 25)
- Pull out power cable
- Place footswitch in its holder
- Ensure that swingarm is blocked (page 28)
- Fold up swingarm
- Tighten articulation brakes (page 30)
- Bring stand to operating table and position in accordance with forthcoming operation (page 31)
- Press footbrakes to engage them (page 31)
- Release safety hook (page 28).

Footswitches
Respect the correct arrangement when positioning (S. 45)

Sterility
Fit sterile components and sterile drapes (page 32).

Basic position
The lamp housing must point in the direction of the stand (front index 1, page 20), otherwise:
- Release the articulation brake
- Turn the microscope appropriately
- Retighten the articulation brake
- Set selector to position 1.

Interpupillary distance
- Set in accordance with user list (page 23)
- Tighten clamping screw.

Double iris diaphragm
(on beam splitter) is to be open (page 35).

Dioptric setting
- Correct in accordance with user list (page 26)
- Tighten clamping screws
- If necessary, treat eyepieces with an antimisting agent.

Oculaires
- Visser, le cas échéant, les anneaux d'écartement (liste des utilisateurs) et les oeillères (p. 24).
- Pour photographier, insérer le réticule de cadrage dans l'oculaire (p. 49).
- Retourner, si nécessaire, les oeillères (liste des utilisateurs, p. 23).

Propreté
- Vérifier la propreté des oculaires et objectifs ainsi que des adaptateurs photo/TV.
- Les nettoyer le cas échéant (p. 51).

Accessoires
- Desserrer les boutons de freinage (p. 30)
- Déplier le bras mobile
- Resserrer les boutons
- Contrôler si le bras mobile est bloqué (p. 28)
- Equiper le microscope de tous les accessoires (modules stéréo courts longs?)

Equilibrage
- Libérer le crochet de retenue (p. 28)
- Mettre le bras mobile en équilibre (p. 29)

Dureté des mouvements
- Régler les boutons de freinage en fonction du poids des accessoires et des besoins de l'opérateur (p. 30).
- Encliqueter le crochet de retenue pour bloquer le bras mobile.

Raccorder les commandes à pédale/manuelle
en respectant la disposition correcte:
- commande à pédale/manuelle ● (rouge) pour chirurgien ● (rouge)
- commande à pédale/manuelle ▲ (bleue) pour chirurgien ▲ (bleue)

Tous les câbles
sont à contrôler.

Position de base
Le boîtier de lampe doit se trouver en direction du statif (index à l'avant 1) (p. 20). Dans le cas contraire:
- desserrer le bouton de freinage
- tourner le microscope
- bloquer le bouton de freinage
- positionner le sélecteur sur 1

Ecartement pupillaire
- Régler l'écartement d'après la liste des utilisateurs (p. 23)
- Serrer la pince à vis

Double diaphragme iris
L'ouvrir (répartiteur optique) (p. 35).

Dioptries
- Les régler conformément à la liste des utilisateurs (p. 26).
- Serrer les pinces à vis.
- Appliquer éventuellement un agent antibuée sur les oculaires.

Contrôle des fonctions
Bloc de commande
Interrupteur activé: le zoom et l'objectif à mise au point se mettent automatiquement en position de base (p. 16).

Fonction Master
La commuter éventuellement (p. 15).

Eclairage
Contrôler et remplacer les ampoules si nécessaire (p. 25)

Fonctions
A l'aide des commandes à pédale, activer le zoom, l'objectif à mise au point et le mouvement XY (p. 16–18).

Régler les vitesses de déplacement (p. 19).

Si votre appareil ne fonctionne pas correctement, contrôler tout d'abord les diodes se trouvant sur le côté du bloc de commande avant de contacter votre représentation Leica (voir aussi page 47).

Opérations finales
Positionner l'instrument
- Position de base XY (index, p. 18).
- Eteindre la lumière et désactiver l'interrupteur principal (p. 25).
- Déconnecter le câble réseau
- Suspendre la commande à pédale au support
- Contrôler si le bras mobile est bloqué (p. 28).
- Plier le bras mobile
- Serrer les boutons de freinage (p. 30)
- Amener le statif à la table d'opération et le placer correctement (p. 31).
- Appuyer sur les freins du statif (p. 31).
- Libérer le crochet de retenue (p. 28).

Commandes à pédale
Respecter la disposition correcte (p. 45).

Asepsie
Mettre les composants et housses stériles en place (p. 32).

Okulare
- Augenmuscheln und gemäss Benutzerliste evtl. Distanzringe festschrauben (S. 24).
- Bei Photographie Strichplatte einsetzen (S. 49).
- Evtl. Augenmuscheln umstülpen (Benutzerliste, S. 23).

Optisches Zubehör säubern
- Okulare, Objektiv, Photo- und TV-Adapter auf Sauberkeit prüfen.
- Staub und Schmutz entfernen (S. 51).

Ausrüsten
- Bremsen lösen (S. 30).
- Schwenkarm auseinanderziehen.
- Bremsen festziehen.
- Kontrollieren: Schwenkarm blockiert (S. 30).
- Mikroskop mit allem Zubehör (Stereo-Module kurz oder lang?) gebrauchsfertig ausrüsten.

Ausbalancieren
- Sperrhaken lösen (S. 28).
- Schwenkarm ins Gleichgewicht bringen (S. 29).

Gangleichtigkeit
- Gelenkbremsen nach persönlichem Bedarf und Zubehörgewicht regulieren (S. 30).
- Sperrhaken festklinken: Schwenkarm blockiert.

Fuss-/Handschalter anschliessen
Richtige Zuordnung beachten:
- Fuss-/Handschalter ● (rot) für Chirurg ● (rot)
- Fuss-/Handschalter▲ (blau) für Chirurg ▲ (blau)

Alle Kabel
auf festen Sitz kontrollieren.

Grundposition
Das Lampenhaus muss in Richtung Stativ zeigen (Index vorn 1, S. 20). Ist dies nicht der Fall:
- Gelenkbremse lösen.
- Mikroskop entsprechend drehen.
- Gelenkbremse festziehen.
- Selektor auf Stellung 1.

Augenabstand
- Gemäss Benutzerliste einstellen (S. 23).
- Klemmschraube festziehen.

Doppelirisblende
(Strahlenteiler) öffnen (S. 35).

Dioptrien
- Gemäss Benutzerliste einstellen (S. 26).
- Klemmschrauben festziehen.
- Okulare evtl. mit Antibeschlagmittel behandeln.

Funktionskontrolle
Steuergerät
Netzschalter ein:
Zoom und Fokus fahren automatisch in ihre Grundstellungen (S. 16).

Master-Funktion
evtl. umschalten (S. 15).

Beleuchtung
kontrollieren, evtl. Glühlampe auswechseln (S. 25).

Funktionen
Mit den Fussschaltern Zoom, Fokus und XY-Verstellung betätigen (S. 16–18).

Verstellgeschwindigkeiten
regulieren (S. 19).

Falls Ihr Gerät nicht einwandfrei funktioniert, prüfen Sie bitte zuerst die Leuchtdioden an der Seite des Steuergeräts, bevor Sie Ihre Leica-Vetretung informieren
(siehe auch S. 47).

Letzte Handgriffe
Instrument positionieren
- XY-Grundposition (Indizes, S. 18).
- Licht aus. Netzschalter aus (S. 25).
- Netzkabel abziehen.
- Fussschalter an der Halterung anhängen.
- Kontrollieren: Schwenkarm blockiert (S. 28).
- Schwenkarm zusammenfalten.
- Gelenkbremsen festziehen (S. 30).
- Stativ zum Operationstisch fahren und im Hinblick auf die bevorstehende Operation plazieren (S. 31).
- Fussbremsen festtreten (S. 31).
- Sperrhaken lösen (S. 28).

Fussschalter
Beim Plazieren richtige Zuordnung beachten (S. 45).

Sterilität
Sterile Komponenten und Sterilhüllen anbringen (S. 32).

Oculares
- Apriete las anteojeras y, en base a la lista de usuarios, eventualmente, los anillos espaciadores (pág. 24).
- Si se va a fotografiar, monte el retículo (pág. 49).
- Si se requiere, vuelva las anteojeras flexibles.

Limpiar ópticos
- Controle si los oculares, el objetivo y el adaptador de fotografía y TV están sucios.
- En caso afirmativo, límpielos (pág. 51).

Accesorios
- Suelte los frenos (pág. 30).
- Despliegue el brazo móvil.
- Vuelva a tirar de los frenos.
- Controlar: El brazo móvil está bloqueado (pág. 28).
- Montaje de los accesorios.

Equilibrado
- Suelte el gancho de bloqueo (pág. 28).
- Equilibre el brazo móvil (pág. 29).

Suavidad de la marcha
- Regule los frenos de articulación y el peso de los accesorios tal y como se requiera (pág. 30).
- Vuelva a encajar el gancho de bloqueo. El brazo móvil está bloqueado.

Conexión del dispositivo de control por pedal/manual
Observe si la disposición es correcta:
- dispositivo de control manual/por pedal ● (rojo), para cirujano ● (rojo).
- dispositivo de control manual/por pedal ▲ (azul), para cirujano ▲ (azul).

Cables
Controle si están todos bién conectados.

Posición básica
La caja de la lámpara debe señalar hacia el estativo (índice delantero: 1, pág. 20), de lo contrario:
- Afloje el freno de articulación.
- Gire el microscopio
- Eche el freno de articulación.
- Ajuste el selector a posición 1.

Distancia interocular
- Fíjela según la lista de usuarios (pág.23).
- Apriete el tornillo.

Diafragma iris doble
- Abra el diafragma (divisor de rayos) (pág.35).

Dioptrías
- Ajústelas en base a la lista de usuarios (pág.26).
- Fije los tornillos de apriete.
- Trate los oculares con un producto antiempañante.

Control de las funciones
Aparato de control
Conecte el interruptor de red: el zoom y el enfoque se ajustan automáticamente a sus posiciones básicas (pág. 16).

Función Master
Si se requiere, conmute (pág. 15).

Iluminación
Contrólela, y si fuera necesario, sustituya la bombilla (pág. 25).

Funciones
Mediante los dispositivos de control por pedal, active el zoom, el enfoque y el ajuste de XY (págs. 16-18).

Velocidades de ajuste
Para su regulación, consulte pág. 19.

Si su instumento no funciona perfectamente, controle los diodos luminosos en el lado del aparato de mando antes de informar a su representación Leica
(véase también pág. 47).

Ultimos preparativos
Posicionado del instrumento
- Posición básica de XY (marcas, pág.18).
- Desconecte la iluminación y el interruptor de red (pág. 25).
- Desenchufe el cable de red.
- Cuelgue el pedal en el soporte.
- Bloquee el brazo móvil (pág. 28).
- Pliegue el brazo móvil.
- Apriete los frenos de articulación (pág. 30).
- Lleve el estativo hasta la mesa de operación y emplácelo tal y como lo requiera la operación (pág. 31).
- Pise los frenos del pie (pág. 31).
- Suelte el gancho de bloqueo (pág. 28).

Dispositivos de control
Al emplazar el equipo, observe si la disposición es correcta (pág. 45).

Asepsia
Coloque los componentes esterilizados (pág. 32).

Use

Switching on and off

Before you switch on or off, make sure that the illuminator regulating knob has been turned off (page 25).

Basic positions when switching on

Power switch on.

What happens:

- The power switch and the 5V and ML diodes on the side of the control unit light up
- Both zooms travel to the basic position 8
- Both focusing drives travel to the basic position
- The zooms are not coupled: Surgeon ● (red) and surgeon ▲ (blue) use their zooms separately. The diodes at ● (red) and at ▲ (blue) do not shine.

Utilisation

Mise sous et hors tension

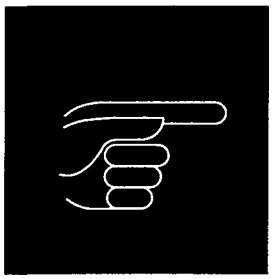
A la mise sous tension, le bouton d'éclairage doit être désactivé (page 25)

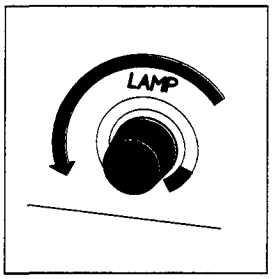
Positions de base à la mise sous tension

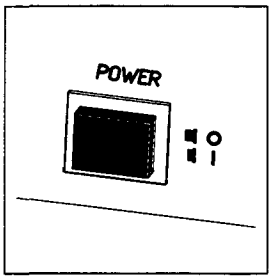
Activer l'interrupteur principal.

Réactions:

- L'interrupteur principal et les diodes 5 V et ML sur le côté du bloc de commande s'allument
- Les deux zooms se mettent en position de base 8
- Les deux mouvements de mise au point se mettent en position de base
- Les zooms ne sont pas couplés, ce qui signifie que les chirurgiens ● (rouge) et ▲ (bleue) manipulent leur zoom individuellement. Les diodes ● (rouge) et ▲ (bleue) ne sont pas allumées.







Bedienung

Ein- und Ausschalten

Beachten Sie beim Ein- und Ausschalten, dass der Beleuchtungsknopf ausgeschaltet ist (S. 25).

Grundstellungen beim Einschalten

Netzschalter ein.

Was geschieht:

- Der Netzschalter und die Dioden 5V und ML an der Seite des Steuergerätes leuchten auf.
- Beide Zooms fahren in die Grundstellung 8.
- Beide Fokussiertriebe fahren in die Grundstellung.
- Die Zooms sind nicht gekoppelt, d.h. die Chirurgen ● (rot) und ▲ (blau) bedienen ihre Zooms individuell. Die Dioden bei ● (rot) und bei ▲ (blau) leuchten nicht.

Manejo

Conexión y desconexión

Al conectar y desconectar, el botón de iluminación debe estar desconectado (pág. 25).

Posiciones básicas al conectar

Conecte el interruptor de red.

¿Qué ocurre?

- El interruptor de red y los diodos 5V y ML en el lado del aparato de mando se iluminan.
- Ambos zooms se ajustan en la posición básica 8.
- Ambos mandos de enfoque se ajustan en la posición básica.
- Los zooms no están acoplados, lo que significa que los cirujanos ● (rojo) y ▲ (azul) manejan sus zooms individualmente. Los diodos en ● (rojo) y ▲ (azul) no lucen.

Use

The master function

In the master function, the two zooms are coupled and are controlled by one of the surgeons.

The zooms are linked and disconnected by pressing the key Z MASTER on the footswitch or handswitch or directly on the microscope.

- **Switch once**
  The diode at ● shines. Surgeon ● (red) uses the zooms.
- **Switch twice**
  The diode at ▲ shines. Surgeon ▲ (blue) uses the zooms.
- **Switch three times**
  No diode shines. Basic position (see page 14).

Whenever the master function is switched, both zooms travel to the basic position 8.

Using the coupled (master) mode

- either surgeon ● (red) or surgeon ▲ (blue) can use the zoom
- each surgeon can focus separately
- both surgeons can control the XY movements
- the focus/XY speed is proportional and depends on the master zoom (see page 19).

Using the non-coupled mode:

- each surgeon can zoom and focus independently of the other
- both surgeons can control the XY movement
- the focus/XY speed is only proportional on one side (see page 19).

Utilisation

La fonction Master

Avec la fonction Master, les deux zooms sont couplés et donc commandés par un seul chirurgien.

Appuyer sur la touche Z MASTER de la commande à pédale ou manuelle ou directement sur le microscope pour coupler ou isoler les deux zooms.

- **Actionner une 1ère fois:**
  La diode ● (rouge) s'allume, le chirurgien ● (rouge) commande les zooms.
- **Actionner une 2e fois:**
  La diode ▲ (bleue) s'allume, le chirurgien ▲ (bleue) commande les zooms.
- **Actionner une 3e fois:**
  Aucune diode ne s'allume = position de base (voir page 14)

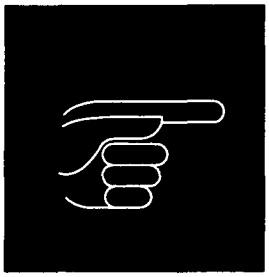
Lors de chaque commutation les deux zooms se mettent en position de base 8.

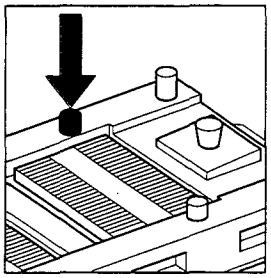
Zooms couplés

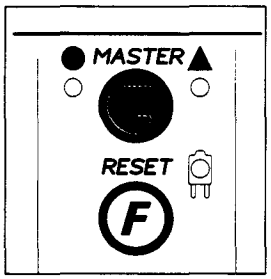
- le chirurgien ● (rouge) ou ▲ (bleue) commande les zooms
- les deux chirurgiens peuvent faire la mise au point individuellement
- les deux chirurgiens peuvent commander les mouvements XY
- la vitesse de la mise au point/XY est proportionnelle et se base sur le zoom Master (voir page 19).

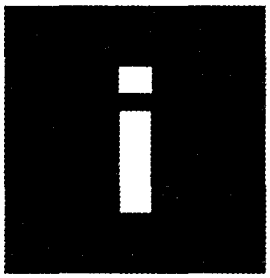
Zooms isolés

- les deux chirurgiens peuvent zoomer et faire la mise au point individuellement
- les deux chirurgiens peuvent commander les mouvements XY
- la vitesse de la mise au point/XY n'est proportionnelle que d'un côté (voir page 19).









Bedienung

Die Master-Funktion

In der Master-Funktion sind beide Zooms gekoppelt und werden von einem Chirurgen bedient.

Durch Druck auf die Taste Z MASTER am Fuss- oder Handschalter oder direkt am Mikroskop können die beiden Zooms ge- und entkoppelt werden:

- **1. Mal schalten:**
  Die Diode bei ● (rot) leuchtet. Chirurg ● (rot) bedient die Zooms.
- **2. Mal schalten:**
  Die Diode bei ▲ (blau) leuchtet. Chirurg ▲ (blau) bedient die Zooms.
- **3. Mal schalten:**
  Keine Diode leuchtet = Grundstellung (siehe S. 14)

Bei jedem Umschalten fahren beide Zooms in die Grundstellung 8.

In gekoppeltem (Master-) Betrieb

- bedient entweder der Chirurg ● (rot) oder ▲ (blau) die Zooms.
- können beide Chirurgen individuell fokussieren.
- können beide Chirurgen die XY-Bewegungen steuern.
- ist die Fokus-/XY-Geschwindigkeit proportional und richtet sich nach dem Master-Zoom (siehe S. 19).

In nicht gekoppeltem Betrieb

- können beide Chirurgen individuell zoomen und fokussieren.
- können beide Chirurgen die XY-Bewegungen steuern.
- ist die Fokus-/XY-Geschwindigkeit nur auf einer Seite proportional (siehe S. 19).

Manejo Zoom y enfoque

La función Master

En la función Master, ambos zooms están acoplados y son manejados por uno de los cirujanos.

Accionando el botón Z MASTER, bien en el dispositivo de control manual o por pedal, bien directamente en el microscopio, pueden acoplarse/desacoplarse los dos zooms:

- **Al accionar por primera vez:**
  El diodo en ● (rojo) luce. El cirujano ● (rojo) controla los zooms.
- **Al accionar por segunda vez:**
  El diodo en ☆ (azul) luce. El cirujano ☆ (azul) controla los zooms.
- **Al accionar por tercera vez:**
  No luce ningún diodo = posición de base, véase pág. 19

Tras cada conmutación ambros zooms se ajustan siempre en las posición básica 8.

Función Master acoplada

- El mando de los zooms lo efectúa el cirujano ● (rojo) o el cirujano ▲ (azul).
- Ambos cirujanos pueden enfocar individualmente.
- Ambos cirujanos pueden controlar los movimientos XY.
- La velocidad de enfoque/XY es proporcional y se adapta al número de aumentos elegido (véase pág. 19).

Función desacoplada

- Ambos cirujanos pueden enfocar y emplear el zoom individualmente.
- Ambos cirujanos pueden controlar los movimientos XY.
- La velocidad de enfoque/XY es proporcional sólo en un lado (véase pág. 19).

Use

Zoom and focus, footswitch

Controlling zoom and focus

The arrangement of the functions on the footswitch can be changed in accordance with your requirements. Ask your Leica consultant.

Activate zoom (Z) and focus (F).

Adjustment speeds
for focus and zoom
(see page 19).

Zoom

Using the non-coupled mode (see page 14), each surgeon can zoom independently of the other.

The magnification set by each user can be read off within the range 5× to 25×. The figure assumes that 10× eyepieces and an f=100 mm objective are used (see optical data on page 59).

Basic zoom position

When the key Z MASTER on the footswitch or handswitch or directly on the microscope is pressed, both zooms automatically return to the basic position 8.

Both zooms always travel automatically to the basic position:

- when the instrument is switched on
- whenever the master function is switched.

Utilisation

Zoom et mise au point, commande à pédale

Commande du zoom et de la mise au point

La disposition des fonctions de la commande à pédale peut être modifiée sur demande. Renseignez-vous auprès de votre conseiller Leica.

Commande du zoom (Z) et de l'objectif de mise au point (F).

Vitesses de réglage
de la mise au point et du zoom (voir p. 19).

Zoom

Lorsque les zooms ne sont pas couplés, chaque chirurgien commande le zoom individuellement (voir page 14).

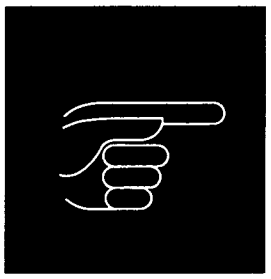
Les grossissements réglés par les deux opérateurs peuvent être lus de 5× à 25×, c'est-à-dire avec les oculaires 10× et l'objectif f=100 mm (voir Données optiques à la page 59).

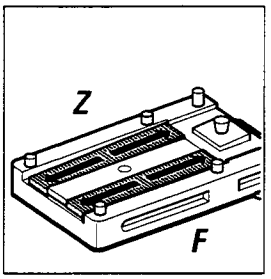
Position de base du zoom

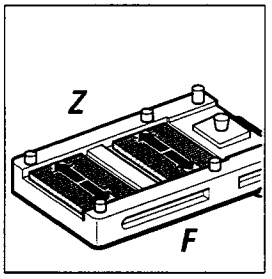
En actionnant la touche MASTER sur la commande à pédale ou manuelle ou directement sur le microscope, on amène automatiquement les deux zooms à la position de base 8.

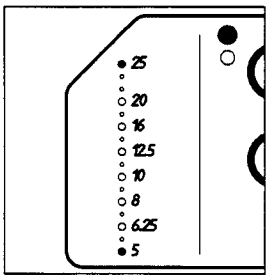
Les deux zooms se mettent automatiquement en position de base

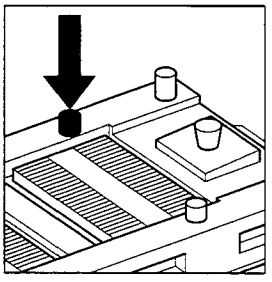
- à la mise sous tension de l'instrument
- lors de chaque commutation de la fonction Master

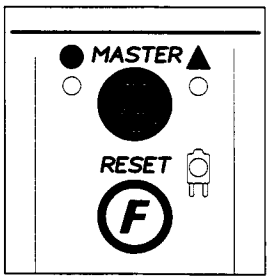












Bedienung

Zoom und Fokus, Fussschalter

Zoom und Fokus steuern

Die Anordnung der Funktionen am Fussschalter kann nach Ihren Wünschen geändert werden. Fragen Sie Ihren Leica-Berater danach.

Zoom (Z) und Fokus (F) steuern.

Verstellgeschwindigkeiten
von Fokus und Zoom siehe S. 19.

Zoom

In nicht-gekoppeltem Betrieb (siehe S. 14) bedienen beide Chirurgen ihre Zooms unabhängig voneinander.

Die von beiden Benutzern eingestellten Vergrösserungen können von 5× bis 25× ablesen werden, d.h. mit Okularen 10× und Objektiv f = 100 mm (siehe optischeDaten S. 59).

Zoom-Grundstellung

Bei Druck auf die Taste MASTER am Fuss- oder Handschalter oder direkt am Mikroskop fahren beide Zooms automatisch auf die Grundstellung 8.

Beide Zooms fahren immer automatisch auf die Grundstellung:

- beim Einschalten des Instruments
- bei jedem Umschalten der Master-Funktion.

Manejo

Zoom y enfoque, dispositivo de control por pedal

Control del zoom y el enfoque

Si lo desea, puede modificarse la disposición de las funciones del dispositivo de control por pedal. Consulte a su asesor Leica.

Control del zoom (Z) y el enfoque (F).

Velocidades de ajuste
de enfoque y zoom, consulte pág. 19.

Zoom

Cuando la función está desacoplada (pág. 14), cada cirujano controla sus propios zooms de forma individual.

Los aumentos seleccionados van de 5× a 25× con los oculares 10× y el objetivo f = 100 mm (véase tabla "datos ópticos", pág. 59).

Posición básica del zoom

Al accionar la tecla MASTER, bien en el dispositivo de control manual o por pedal, bien directamente en el microscopio, los dos zooms se ajustan automáticamente en la posición básica 8.

Ambos zooms se ajustan siempre automáticamente en la posición básica:

- al conectar el instrumento
- tras cada conmutación de la función Master.

Focusing
The focusing drive is nondirectional and has no upper or lower limits. The two surgeons use their focusing drives independently of one another.

Basic focus position
When the key RESET on the footswitch or handswitch or directly on the microscope is pressed, the focusing drive automatically returns to the basic focus position.

The focusing drive always travels automatically to the basic position:
- when the instrument is switched on
- whenever the RESET key is pressed.

The tilt of the footswitch
can be set by turning the two spindles

Handgrips
You can use the sterilizable handgrips to position the surgical microscope precisely.

Sterile controls (see p. 32)

Mise au point
Indépendant de la direction, le mouvement de mise au point n'a pas de limite. Les deux chirurgiens commandent donc toujours leur mouvement de mise au point indépendamment l'un de l'autre.

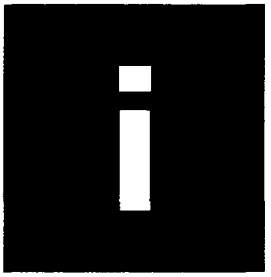
Position de base du mouvement de mise au point
Lorsque la touche RESET est actionnée, sur la commande à pédale ou manuelle ou directement sur le microscope, les deux zooms se mettent automatiquement en position de base 8.

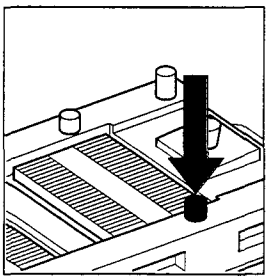
Le mouvement de mise au point se met automatiquement en position de base
- à la mise sous tension de l'instrument
- lors de chaque pression sur la touche RESET

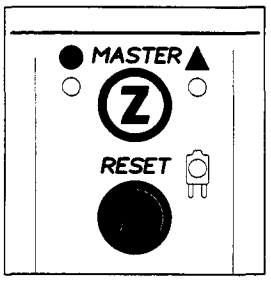
L'inclinaison de la commande à pédale
peut être modifiée en tournant les deux broches.

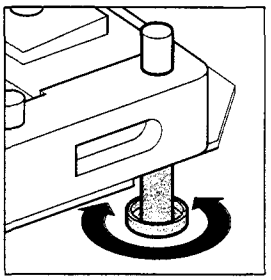
Poignées de positionnement
Les poignées stérilisables permettent de positionner le microscope d'opération avec précision.

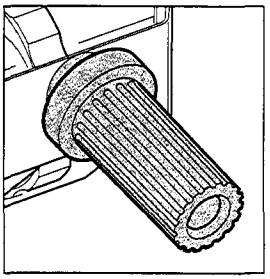
Eléments de commande stérilisables (voir p. 32).











Fokussieren
Der Fokussiertrieb ist nicht richtungsorientiert und hat keine obere/untere Begrenzung. Beide Chirurgen bedienen ihre Fokussiertriebe immer unabhängig voneinander.

Fokus-Grundstellung
Bei Druck auf die Taste RESET am Fuss- oder Handschalter oder direkt am Mikroskop fährt der Fokussiertrieb automatisch in die Fokus-Grundstellung.

Der Fokussiertrieb fährt automatisch in die Grundstellung:
- beim Einschalten des Geräts
- bei Druck auf die Taste RESET.

Die Neigung des Fusschalters
kann durch Drehen an den beiden Spindeln eingestellt werden.

Handgriffe
Mit den sterilisierbaren Handgriffen können Sie das Operationsmikroskop feinfühlig positionieren.

Sterile Komponenten (siehe S. 32).

Enfoque
El mando de enfoque no tiene límites inferior o superior y los dos cirujanos lo accionan siempre de forma independiente.

Posición básica de enfoque
Al accionar la tecla RESET, bien en el dispositivo de control manual o por pedal, bien directamente en el microscopio, el mando de enfoque se ajusta automáticamente en la posición básica.

El mando de enfoque se ajusta automáticamente en la posición de base:
- al conectar el instrumento
- al accionar la tecla RESET.

Inclinación del dispositivo de control por pedal
Puede regularla a su gusto. Para ello, debe girar los dos husillos.

Empuñaduras
Las empuñaduras esterilizables le permiten emplazar el microscopio de forma exacta.

Elementos de mando esterilizables (véase pág. 32).

Use

XY-movements

Never tilt or swivel the microscope when the swingarm is folded up.

With the system in either coupled or uncoupled mode, the XY-movements can be performed by either surgeon.

For **adjustment speed,** see page 19.

You can control the XY-movements

- with the joystick (detachable) on the footswitch
- with the four keys on the handswitch.

In an emergency, the XY movements can be carried out manually:

- Remove the two dust plugs (see diagram below)
- Insert the Allen key supplied into the openings and tilt and swivel the microscope

Utilisation

Mouvements XY

Ne jamais basculer ou incliner le microscope quand le bras mobile est plié!

Les mouvements XY sont commandés par les deux chirurgiens aussi bien en mode isolé qu'en mode couplé.

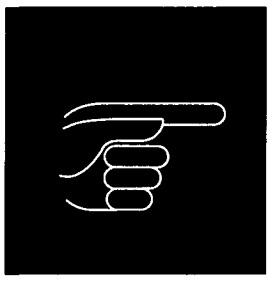
Voir page 19 pour les **vitesses de réglage.**

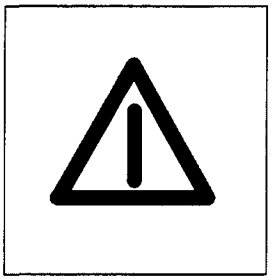
Les mouvements XY se commandent à l'aide

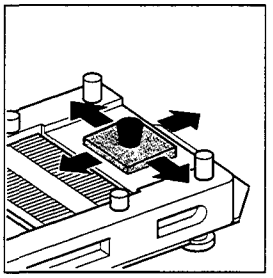
- du joystick (dévissable) de la commande à pédale
- des 4 touches de la commande manuelle

En cas d'urgence, les mouvements XY peuvent être réglés manuellement:

- retirer les deux couvercles de protection (voir fig. ci-dessous)
- introduire dans les orifices la clé à six pans, faisant partie de la livraison, et pivoter/incliner le microscope.







Bedienung

XY-Bewegungen

Mikroskop nie schwenken/neigen, wenn der Schwenkarm zusammengefaltet ist!

Die XY-Bewegungen können sowohl im nicht gekoppelten als auch im gekoppeltem Betrieb von beiden Chirurgen bedient werden.

Verstellgeschwindigkeit siehe S. 19.

Sie steuern die XY-Bewegungen

- mit dem Joystick (kann auch abgeschraubt werden) am Fussschalter
- mit den 4 Tasten am Handschalter

Im Notfall können die XY-Bewegungen manuell eingestellt werden:

- Zwei Staubschutzdeckel (sieh Abb. unten) entfernen.
- Inbusschlüssel (mitgeliefert) in die Öffnungen führen und Mikroskop schwenken/ neigen.

Manejo

Movimientos XY

¡No gire o incline nunca el microscopio estando el brazo móvil plegado!

Los movimientos XY pueden ser controlados por ambos cirujanos, tanto en modo acoplado como desacoplado.

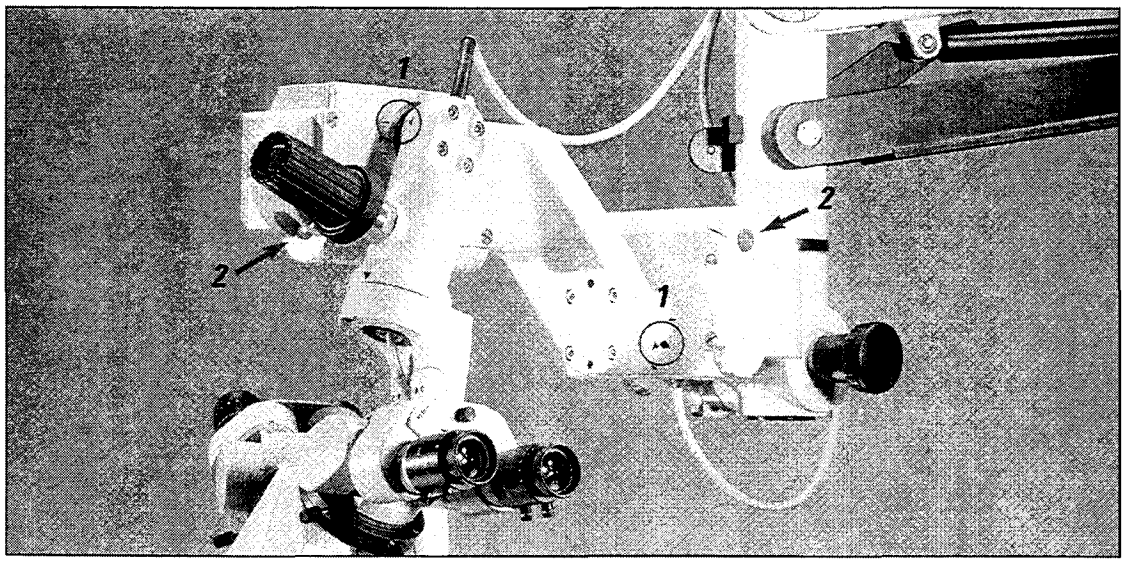
Velocidades de ajuste, consulte pág. 19.

Usted controla los movimientos XY

- mediante el joystick (puede desatornillarse) en el dispositivo de control por pedal
- mediante las 4 teclas del dispositivo de control manual

En caso necesario puede ajustar manualmente los movimientos XY:

- retire las dos tapas de protección (véase fig. inferior)
- introduzca la llave Allen (includa en el suministro) en las aberturas y gire/incline el microscopio.



1 Indexes on microscope carrier: Basic XY positions

1 Index sur porte-microscope: positions de base XY.

1 Indizes am Mikroskopträger: XY-Grundpositionen.

1 Marcas en el portamicroscopio: posiciones básicas XY.

2 Two Allen keys for manual XY adjustment

2 Vis à six pans pour le réglage manuel de XY.

2 Inbusschrauben für manuelle XY-Verstellung

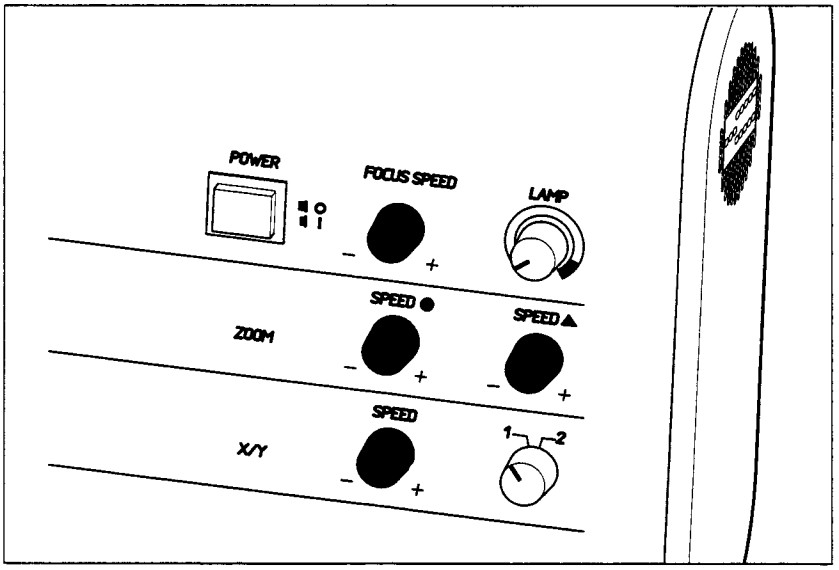
2 Tornillos de cabeza hexagonal para el ajuste manual XY.

Use

Adjustment speeds

Basic speeds

The adjustment speeds for zoom (ZOOM SPEED), focus (FOCUS SPEED) and XY movement can be set with the knobs on the control unit.



Proportional speeds

The focus and XY movements become slower with increasing magnification, but the actual speed depends on the basic speed initially selected (see above).

In uncoupled mode

the speed is proportional on one side only:

- in the basic microscope position 1 on the side ● (red)
- in the microscope position 2 on the side ▲ (blue).

On the other side, focus and XY change in accordance with the basic speed chosen.

In coupled mode

the speed is proportional on both sides and depends on the magnification selected by MASTER.

Utilisation

Vitesses de réglage

Vitesses de base

Les boutons du bloc de commande permettent de sélectionner les vitesses de réglage du zoom (ZOOM SPEED), de la mise au point (FOCUS SPEED) et des mouvements XY.

Vitesse proportionnelle

En fonction de la vitesse de base choisie, la mise au point et XY se déplacent, selon le grossissement, plus rapidement ou plus lentement. Plus le grossissement est élevé, plus le déplacement est lent.

En mode isolé,

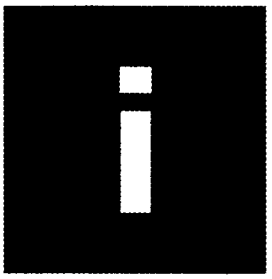
la vitesse n'est proportionnelle que d'un côté:

- en position de base 1 du microscope, côté ● (rouge)
- en position 2 du microscope, côté ▲ (bleue)

De l'autre côté, la mise au point et XY se déplacent selon la vitesse de base choisie.

En mode couplé,

la vitesse est proportionnelle des deux côtés et se base sur le grossissement choisi par MASTER.



Bedienung

Verstell-geschwindigkeiten

Basis-geschwindigkeiten

Mit den Knöpfen am Steuergerät können die Verstellgeschwindigkeiten von Zoom (ZOOM SPEED), Fokus (FOCUS SPEED) und XY-Bewegungen vorgewählt werden.

Proportional-Geschwindigkeit

Ausgehend von der gewählten Basisgeschwindigkeit (s.o.) verstellen sich Fokus und XY je nach Vergrösserung schneller oder langsamer. D.h. je höher die Vergrösserung umso langsamer verstellen sich Fokus und XY.

In nicht gekoppeltem Betrieb

ist die Geschwindigkeit nur auf einer Seite proportional:

- in Mikroskop-Grundposition 1 auf der Seite ● (rot)
- in Mikroskop-Position 2 auf der Seite ▲ (blau).

Auf der anderen Seite verstellen sich Fokus und XY gemäss der gewählten Grundgeschwindigkeit.

Im gekoppelten Betrieb

ist die Geschwindigkeit auf beiden Seiten proportional und richtet sich nach der vom MASTER gewählten Vergrösserung.

Manejo

Velocidades de ajuste

Velocidades básicas

Los botones del aparato de mando permiten preseleccionar las velocidades de ajuste del zoom (ZOOM SPEED), enfoque (FOCUS SPEED) y movimientos XY.

Velocidad proporcional

En función de la velocidad de base fijada en el aparato de mando (véase arriba), el enfoque y XY se ajustan más rápida o lentamente según el aumento. En otras palabras, cuanto mayor sea el aumento, tanto más despacio se ajustarán el enfoque y XY.

Con función desacoplada

La velocidad de enfoque/XY es proporcional sólo en un lado:

- en la posición básica de microscopio 1 en el lado ● (rojo)
- en la posición básica de microscopio 2 en el lado ▲ (azul).

En el otro lado, el zoom y XY se ajustan según la velocidad básica elegida.

Con función acoplada

La velocidad de enfoque/XY es proporcional y se adapta al número de aumentos elegido.

Use

Microscope positions

When turning the microscope, be careful not to damage accessories such as the TV camera.

Basic microscope position 1

- The lamp housing and the control panel must face the stand (index 1 in front).

- Selector in position 1
- The microscope is individually equipped for each surgeon: Stereo module, interpupillary distance, eyecups, spacing rings, dioptric settings.

Utilisation

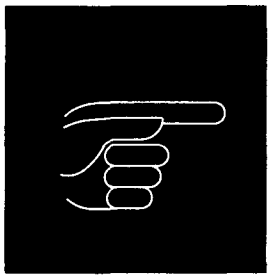
Positions du microscope

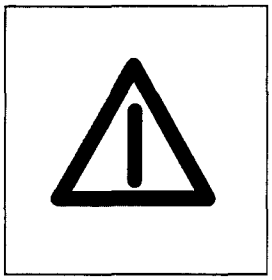
En tournant le microscope, veiller à ne pas endommager les accessoires (caméra TV)!

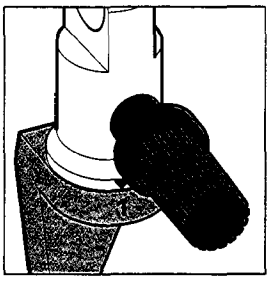
Microscope en position de base 1

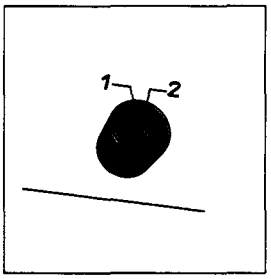
- Boîtier de lampe et champ de contrôle en direction du statif (index 1)

- Sélecteur en position 1
- Microscope équipé individuellement pour les deux chirurgiens: module stéréo, écartement pupillaire, oeillères, anneaux d'écartement, dioptries.









Bedienung

Mikroskop-Positionen

Beim Drehen des Mikroskops auf das Zubehör (TV-Kamera) achten, damit es dabei nicht beschädigt wird!

Mikroskop-Grundposition 1

- Das Lampenhaus und das Kontrollfeld zeigen zum Stativ (Index 1).

- Selektor in Stellung 1.
- Das Mikroskop ist für beide Chirurgen individuell eingerichtet: Stereo-Modul, Augenabstand, Augenmuscheln, Distanzringe, Dioptrien.

Manejo

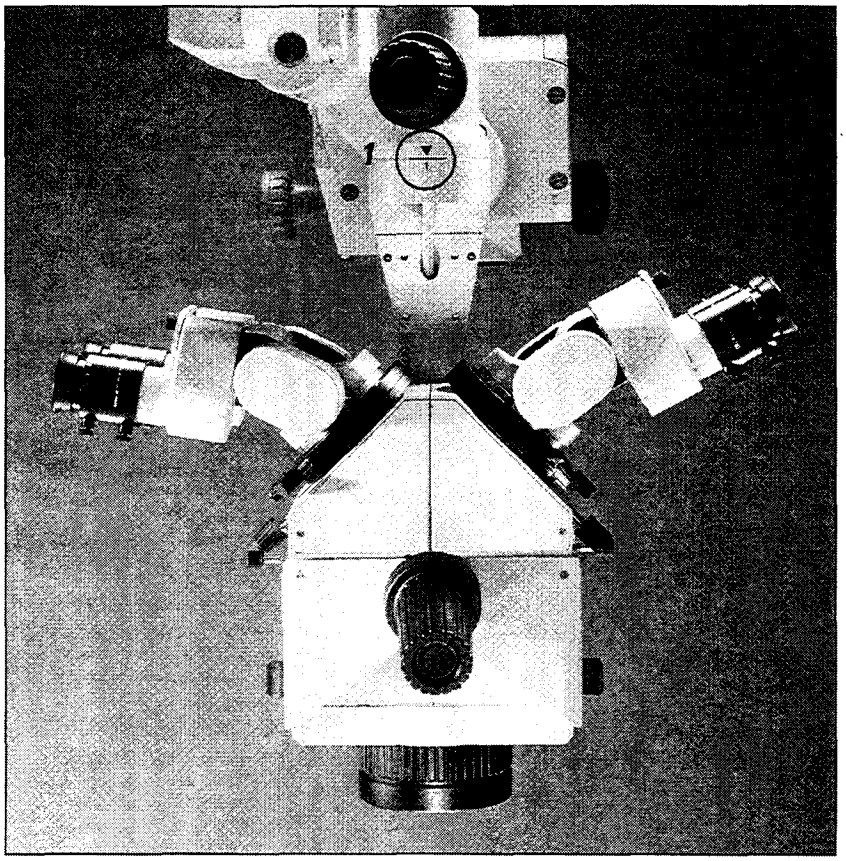
Posiciones del microscopio

Cuando gire el microscopio tenga cuidado para no golpear los accesorios (cámara TV).

Posición básica de microscopio 1

- La caja de la lámpara y el campo de control señalan hacia el estativo (índice 1).

- Ajuste el selector en posición 1.
- El microscopio está acoplado individualmente a cada cirujano: módulo estereoscópico, distancia interocular, anteojeras, anillos espaciadores, dioptrías.



Microscope position 1:
Index 1 in front, lamp housing and control panel facing stand

Microscope en position de base 1:
index 1 à l'avant, boîtier de lampe et champ de contrôle en direction du statif.

Mikroskop-Position 1:
Index 1 vorn, Lampenhaus und Kontrollfeld in Richtung Stativ.

Posición básica de microscopio 1:
índice 1 delante, caja de la lámpara y campo de control señalan hacia el estativo.

Changing to microscope position 2

Example: Gynaecology

First phase of operation is carried out in basic microscope position 1 (p. 20).

Second phase of operation is carried out in microscope position 2:

- The surgeons change sides
- Release the articulation brakes
- Turn the microscope 180° anticlockwise (lamp housing away from stand, Index 2 in front). This makes it unnecessary to re-equip the microscope, because "the two surgeons bring their own personal outfits."

- **Selector in position 2.**

The footswitch no longer needs to be repositioned.

Mettre le microscope en position 2

Exemple: gynécologie

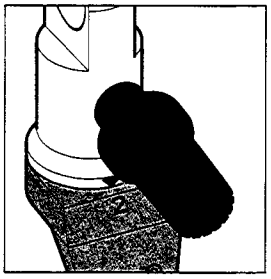
La première partie de l'opération s'effectue avec le microscope en position de base 1 (p. 20), et la

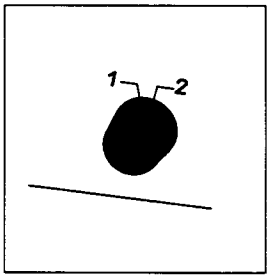
deuxième partie en position 2:

- Les deux chirurgiens changent de côté.
- Desserrer les boutons de freinage
- Tourner le microscope de 180° dans le sens inverse des aiguilles d'une montre (boîtier de lampe éloigné du statif, index 2 à l'avant). Ceci permet d'éviter de changer l'équipement du microscope.

- **Mettre le sélecteur en position 2**

pour éviter de déplacer la commande à pédale.





In die Mikroskop-Position 2 wechseln

Beispiel: Gynäkologie

Erster Teil der Operation in Mikroskop-Grundposition 1 (S. 20).

Zweiter Teil der Operation in Mikroskop-Position 2:

- Beide Chirurgen wechseln die Seite.
- Gelenkbremse lösen.
- Mikroskop gegen den Uhrzeigersinn um 180° verdrehen (Lampenhaus weg vom Stativ, Index 2 vorn). Dadurch wird ein Umrüsten des Mikroskops überflüssig: "Beide Chirurgen nehmen ihre persönliche Einrichtung mit."

- **Selektor in Stellung 2.**

Dadurch ist ein Umplazieren der Fussschalter überflüssig.

Cambio a la posición básica 2

Ejemplo: ginecología

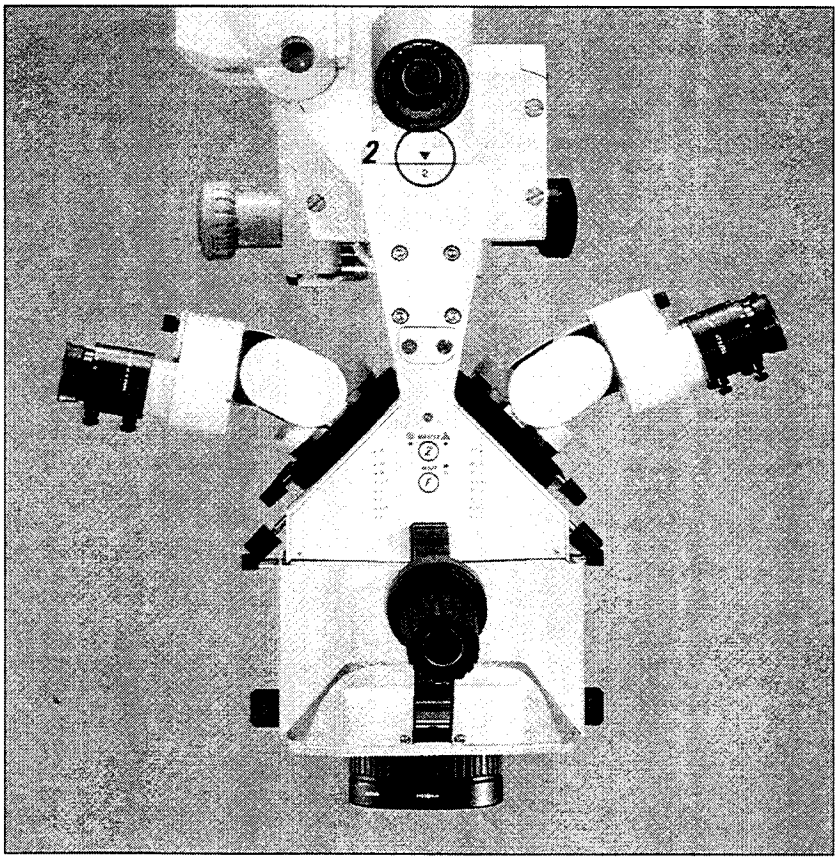
La primera parte de la operación en posición básica 1 (pág. 20), y

la segunda, en posición básica 2:

- Los dos cirujanos cambian de lado.
- Suelte el freno de articulación.
- Gire el microscopio en 180°, en dirección contraria de las agujas del reloj (caja de la lámpara fuera del estativo, índice 2 delante). De esta manera, el microscopio no requiere ninguna nueva adaptación, puesto que cada cirujano "se lleva consigo"su correspondiente equipo.

- **Selector en posición 2.**

Esto le evita el tener que desplazar los dispositivos de control por pedal.



Microscope position 2: Index 2 in front, lamp housing and control panel facing stand

Microscope en position 2: index 2 à l'avant, boîtier de lampe et champ de contrôle vers l'avant

Mikroskop-Position 2: Index 2 vorn, Lampenhaus und Kontrollfeld vorn.

Posición básica de microscopio 2: índice 2 delante, caja de la lámpara y campo de control delante.

Use

Stereo modules, tube adapter, binocular tube

Assembly: See page 48

Stereo modules

Each of the two surgeons can choose either a short or a long stereo module in accordance with the surgical discipline, the microscope outfit, and personal preferences.

Utilisation

Modules stéréo, bague intermédiaire tournante, tube binoculaire

Pour le montage, voir page 48

Modules stéréo

Les deux chirurgiens peuvent choisir entre les modules stéréo courts et longs selon le mode d'opération, l'équipement du microscope et leurs besoins.

Bedienung

Stereo-Module, Tubuszwischenstück, Binokulartubus

Montage siehe S. 48

Stereo-Module

Je nach Operationsart, Mikroskop-Ausrüstung und persönlichen Wünschen können beide Chirurgen zwischen kurzen und langen Stereo-Modulen wählen.

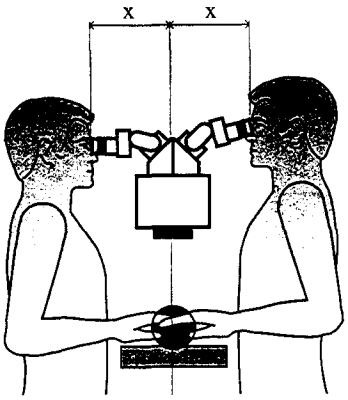
Manejo

Módulos estereoscópicos, pieza intermedia giratoria, tubo binocular

Montaje, véase pág. 48

Módulos estereoscópicos

Dependiendo del tipo de intervención y de las preferencias personales, ambos cirujanos pueden elegir entre módulos estereoscópicos en versión larga y corta.

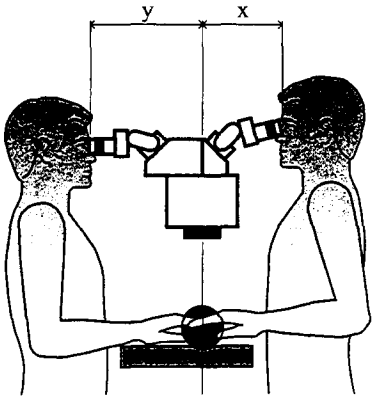


Example 1:
Narrow operating table, symmetrical field of operation: Short/short stereo modules

Exemple 1:
Table d'opération étroite et champ opératoire symétrique: modules stéréo court/court

Beispiel 1:
Operationstisch schmal und Operationsfeld symmetrisch: Stereo-Module, kurz/kurz

Ejemplo 1:
Mesa de operación estrecha y campo de operación simétrico: módulos estereoscópicos corto/corto.

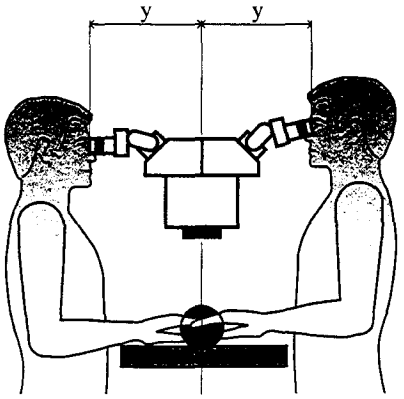


Example 2:
Broad operating table, asymmetrical field of operation: Long/short stereo modules

Exemple 2:
Table d'opération large et champ opératoire asymétrique: modules stéréo long/court

Beispiel 2:
Operationstisch breit und Operationsfeld asymmetrisch: Stereo-Module, lang/kurz

Ejemplo 2:
Mesa de operación ancha y campo de operación asimétrico: módulos estereoscópicos largo/corto.



Example 3:
Broad operating table, symmetrical field of operation: Long/long stereo modules

Exemple 3:
Table d'opération large et champ opératoire symétrique: modules stéréo long/long

Beispiel 3:
Operationstisch breit und Operationsfeld symmetrisch: Stereo-Module, lang/lang

Ejemplo 3:
Mesa de operación ancha y campo de operación simétrico: módulos estereoscópicos largo/largo.

Tube adapter, rotatable ±30°

If, because of the microscope configuration, the binocular tube tilts sideways, you can level it up again with this tube adapter:

- Release clamping screw (b).
- Turn binocular up to 30° to the left or right.

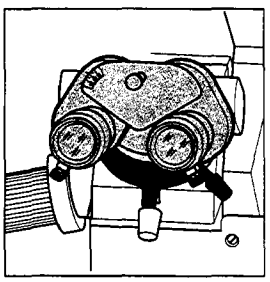
The binocular tube is secured to the tube adapter by means of the clamping screw (a).

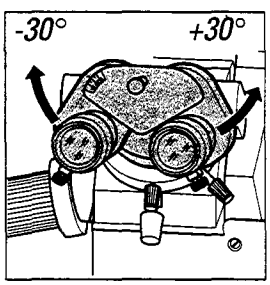
Bague intermédiaire tournante

Cette bague permet de mettre le tube binoculaire à l'horizontale lorsque le microscope est incliné:

- Desserrer la pince à vis (b).
- Tourner le tube binoculaire sur la gauche ou la droite jusqu'à 30°.

Le tube binoculaire est fixé sur la bague intermédiaire par la pince à vis (a).





Tubuszwischenstück, drehbar

Das Tubuszwischenstück erlaubt, den Binokulartubus in Mikroskop-Schräglage horizontal auszurichten:

- Klemmschraube (b) lösen.
- Binokulartubus nach links bzw. rechts bis max. 30° verdrehen.

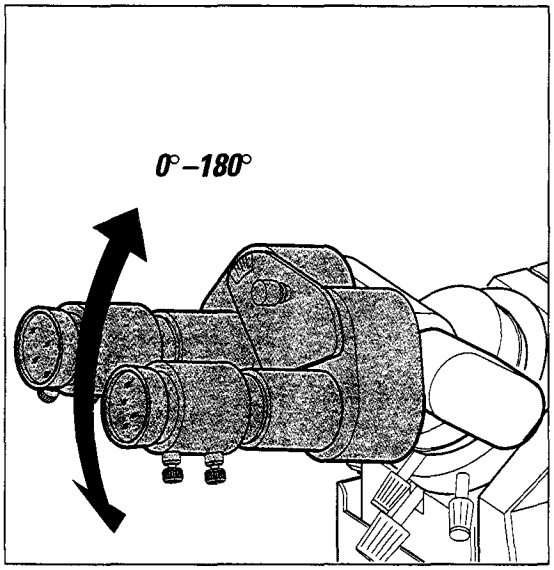
Mit der Klemmschraube (a) ist der Binokulartubus auf dem Tubuszwischenstück befestigt.

Pieza intermedia giratoria, ±30°

Estando el microscopio inclinado, este adaptador permite girar el tubo binocular horizontalmente.

- Afloje el tornillo de apriete (b).
- Gire el tubo hasta un máximo de 30° hacia la derecha o la izquierda.

El tornillo de apriete (a) fija el tubo binocular en la pieza intermedia giratoria.



Binocular tube with variable angle of observation 0°-180°

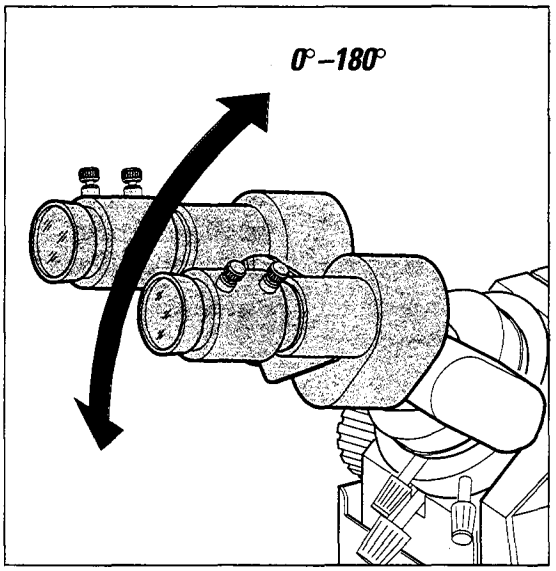
Possibilities for adjustment

- Choice of two viewing heights
- Viewing angle continuously variable within the range 0°–180°.

Tube binoculaire à angle d'observation variable

Possibilités

- Le tube binoculaire peut être adapté pour deux hauteurs différentes.
- Le tube permet de régler l'angle et la hauteur d'observation de 0° à 180°.



Binokulartubus mit variablem Einblickwinkel

Varianten

- Der Binokulartubus kann für 2 unterschiedliche Ausgangshöhen montiert werden.
- Einblickwinkel/-höhe können zusätzlich von 0°–180° eingestellt werden.

Tubo binocular con ángulo de observación variable

- El tubo binocular puede acoplarse para dos alturas de salida diferentes.
- Adicionalmente puede ajustar el ángulo y la altura de observación de 0° a 180°.

Interpupillary distance

Set your interpupillary distance as follows:

- Release the clamping screw
- Look into the eyepieces and displace the tubes of the binocular with both hands until you see a single circular field
- Tighten the clamping screw.

Scale

Read off the interpupillary distance from the scale.

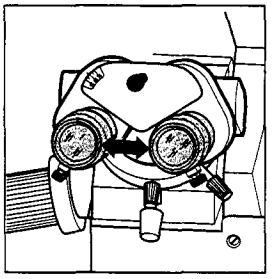
Ecartement pupillaire

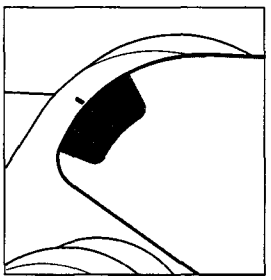
Procédure:

- Desserrer la pince à vis.
- Regarder dans les oculaires et déplacer des deux mains les tubes jusqu'à l'obtention d'un unique champ circulaire.
- Serrer la pince à vis.

Echelle

L'écartement pupillaire est lisible sur l'échelle.





Augenabstand

So stellt der Benutzer seinen Augenabstand fest:

- Klemmschraube lösen.
- In die Okulare schauen und Tubusrohre mit beiden Händen verschieben, bis Sie ein einziges kreisrundes Bildfeld sehen.
- Klemmschraube festziehen.

Skala

An der Skala ist der Augenabstand ablesbar.

Distancia interpupilar

Para determinar su distancia interpupilar proceda como sigue:

- Afloje el tornillo de apriete.
- Mire a través de los oculares y mueva los tubos con ambas manos hasta que vea un único campo circular.
- Apriete el tornillo.

Escala

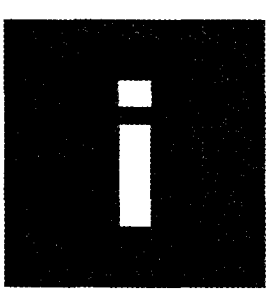
En la escala puede leer la distancia fijada.

Recommendation: User list

Draw up a list of users, to include personal requirements such as interpupillary distance, dioptric settings, whether or not spacing rings are required etc., and have the microscope adjusted accordingly for each user in turn.

Remarque: liste des utilisateurs

Tenir une liste avec les données personnelles de l'utilisateur telles que écartement pupillaire, dioptries, avec/sans anneau d'écartement, etc. et préparer ensuite le microscope.



Tip: Benutzerliste

Führen Sie eine Liste mit den persönlichen Daten der Benutzer wie Augenabstand, Dioptrien, mit/ ohne Distanzring usw. und bereiten Sie das Mikroskop danach vor.

Recomendación: lista de usuarios

Establezca una lista con los datos personales de los usuarios como distancia interpupilar, dioptrías, anillos espaciadores, etc. y prepare posteriormente el microscopio en base a ésta.

Use

Wide-field eyepieces for spectacle wearers

Fitting: See page 49

Recommendation: See page 23

If you work without spectacles

and want closer eye contact:

- Screw off the eyecups
- Screw a 6mm and/or 9mm spacing ring on to each eyepiece
- Screw the eyecups firmly back into position.

If you work with spectacles:

- Do not fit spacing rings
- Fold back the flexible eyecups if you need the full working distance.

Eyepoint

To position your eyes at the right distance from the eyepieces (22mm), proceed as follows: Bring your eyes slowly towards the eyepieces until you see the full field of view.

Adjusting the dioptric settings:

- Release the clamping screw
- Set the dioptric adjustment within the range from +5 to –5 in accordance with the values given in the user list.

  Refer to page 26 for an explanation of how these values are determined.
  Each user need follow this procedure only once. Set the dioptric values exactly in order to maximize the optical advantages of the WILD M680
- Retighten the clamping screws.

Utilisation

Oculaires grand-angulaires pour porteurs de lunettes

Pour le montage, voir page 49.

Remarque, voir page 23.

Travail sans lunettes

Pour une très petite distance entre l'oeil et l'oculaire:

- dévisser les oeillères
- fixer les anneaux d'écartement 6 mm et/ou 9 mm sur l'oculaire
- revisser les oeillères

Travail avec lunettes

- Ne pas utiliser d'anneaux d'écartement
- Retourner éventuellement les oeillères

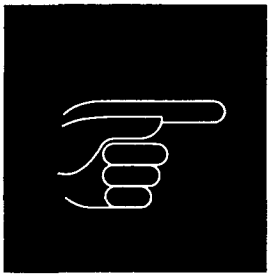
Pupille d'émergence

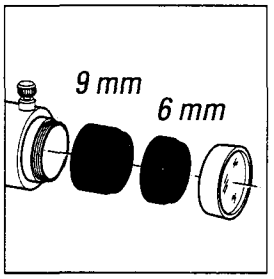
Pour trouver la distance correcte (22 mm) entre l'oeil et l'oculaire, approcher lentement les yeux des oculaires jusqu'à observer la totalité du champ sans parties sombres.

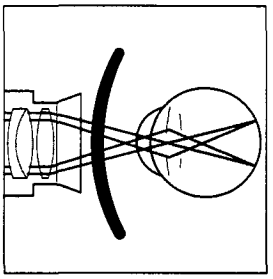
Dioptries

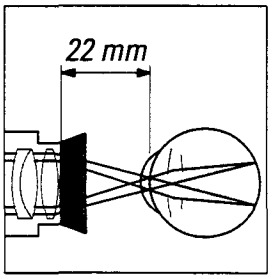
- Desserrer les pinces à vis
- Tourner les lentilles d'oeil de +5 à –5 conformément à la liste des utilisateurs.

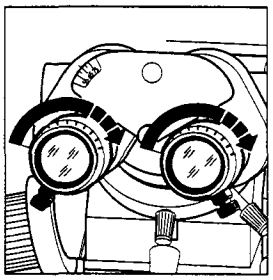
  La façon de déterminer les valeurs pour chaque utilisateur est mentionnée à la page 26.
  N'effectuer cette procédure qu'une seule fois pour pouvoir exploiter pleinement les avantages du système optique du WILD M680.
- Serrer les pinces à vis.











Bedienung

Weitwinkel-Brillenträgerokulare

Montage siehe S. 49.

Tip siehe S. 23.

Wenn Sie ohne Brille arbeiten

und einen engen Augenkontakt wünschen:

- Augenmuscheln abschrauben.
- Distanzringe 6 mm und/oder 9 mm am Okular festschrauben.
- Augenmuscheln wieder festschrauben.

Wenn Sie mit Brille arbeiten:

- Keine Distanzringe einsetzen.
- Evtl. auch noch die Augenmuscheln nach hinten umstülpen.

Pupillenlage

So finden Sie den richtigen Abstand (22 mm) der Augen zu den Okularen: Augen langsam an die Okulare führen, bis Sie das volle Bildfeld ohne Abschattungen sehen.

Dioptrien einstellen:

- Klemmschrauben lösen.
- Dioptrien gemäss Benutzerliste durch Drehen der Augenlinsen von +5 bis –5 einstellen.

  Wie jeder Benutzer die Werte feststellen kann, ist auf der S. 26 beschrieben.
  Jeder Benutzer muss diesen Vorgang nur einmal durchführen. Bitte halten Sie sich genau daran, damit Sie die optischen Vorteile des WILD M680 voll nutzen können.
- Klemmschrauben festziehen.

Manejo

Oculares granangulares para observadores con gafas

Montaje, véase pág. 49

Recomendación, véase pág. 23

Si trabaja sin gafas

y desea un estrecho contacto con los oculares:

- desatornille las anteojeras
- Atornille en el ocular los anillos espaciadores de 6 y/o 9mm.
- Vuelva a apretar fuertemente las anteojeras.

Si trabaja con gafas:

- no acople anillos espaciadores
- y si fuera necesario, vuelva las anteojeras hacia atrás.

Pupila de salida

Para hallar la distancia correcta de los ojos a los oculares (22 mm), lleve los ojos lentamente hacia los oculares hasta que vea la totalidad del campo visual.

Ajuste de las dioptrías:

- Afloje los tornillos de apriete.
- Ajuste las dioptrías de +5 a –5 en base a la lista de usuarios, moviendo para ellos las lentes oculares.

  El método para determinar los valores se describe en la pág. 26.
  Cada usuario debe llevar a cabo este proceso sólo una vez. Por favor, aténgase a las instrucciones, con el fin de sacar el mayor rendimiento óptico al WILD M680.
- Apriete los tornillos.

Use

Illumination

The field of view stays fully illuminated during the zooming procedure and the image-side brightness remains constant. This avoids tiring repeated adaptations to changes in light intensity.

Switching on the illumination

Before you switch on or off, make sure that the rotary knob of the illuminator has been turned off. This lengthens the life of the bulbs.

Then:
- Turn on the power switch. The 5V and ML diodes at the side of the control unit shine.
- Use the rotary knob to switch on the light and to adjust the brightness.

Switching off the illumination

The following procedure lengthens the life of the bulb:
- Use the rotary knob to switch off the light
- Then switch off the power.

Quick-change lamp mount

If a bulb fails during the operation, turn the wheel to bring the second bulb into position.

The **warning lamp** shines as a reminder to insert a new bulb later (page 49).

Filters

Both users can slide into the beam path a filter holder carrying a KB12 daylight filter or a VG9 green filter.

Utilisation

Eclairage

Chaque champ visuel est automatiquement éclairé pendant le zoomage et l'intensité lumineuse reste constante du côté observateur/accessoires. Ceci évite la fatigante accommodation aux conditions variables d'éclairage (obscurité/clarté).

Mise sous tension de l'éclairage

Le bouton doit être complètement tourné sur la gauche. Vous ménagez ainsi les ampoules.
- Activer l'interrupteur; il doit s'allumer ainsi que les diodes 5 V et ML du bloc de commande.
- Régler l'intensité lumineuse au moyen du bouton rotatif.

Mise hors tension de l'éclairage

En procédant ainsi, on augmente la durée de vie des ampoules.
- Tourner le bouton rotatif jusqu'à la butée.
- Désactiver l'interrupteur.

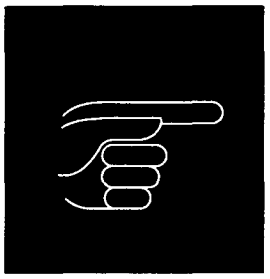
Changeur rapide d'ampoule

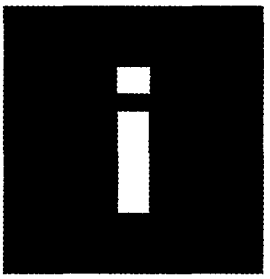
Si l'une des ampoules grille pendant l'opération, amener la deuxième ampoule dans l'axe optique en tournant le disque.

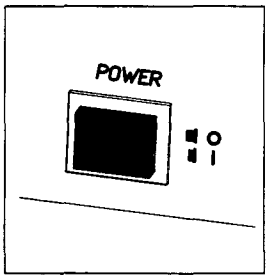
La **lampe d'avertissement** s'allume et signale qu'une ampoule est à remplacer (page 49).

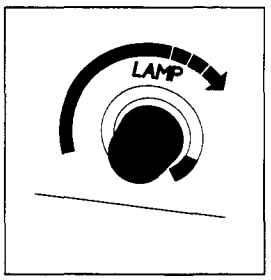
Filtres

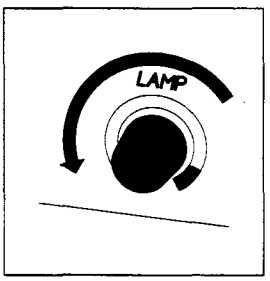
Les deux utilisateurs peuvent introduire dans le trajet optique un porte-filtre avec filtre lumière du jour KB12 ou filtre vert VG9.

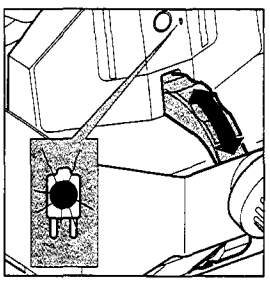


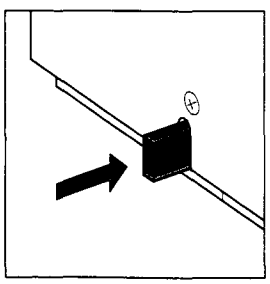












Bedienung

Beleuchtung

Die Gesichtsfelder sind beim zoomen immer automatisch voll ausgeleuchtet. Die Helligkeit bleibt auf der Beobachter-/Zubehörseite konstant. Die sonst so ermüdende Hell-/ Dunkeladaption der Augen entfällt.

Beleuchtung einschalten

Vergewissern Sie sich, dass der Regulierknopf ausgeschaltet ist. Sie schonen damit die Glühlampen.

Dann erst:
- Netzschalter ein. Der Netzschalter und die Dioden 5V und ML an der Seite des Steuergerätes leuchten auf.
- Mit dem Regulierknopf Licht einschalten und Helligkeit regulieren.

Beleuchtung ausschalten

Mit diesem Vorgehen erhöhen Sie die Lebensdauer der Glühlampe.:
- Zuerst Licht mit dem Regulierknopf abschalten.
- Dann erst den Netzschalter ausschalten.

Lampenschnellwechsler

Fällt während der Operation eine Glühlampe aus, am Rad drehen, bis die zweite Glühlampe einrastet.

Die **Warnlampe** leuchtet und erinnert daran, später eine neue Glühlampe einzusetzen (S. 49).

Filter

Beide Benutzer können einen Filterhalter mit KB12 Tageslichtfilter oder Grünfilter VG9 in den Strahlengang schieben.

Manejo

Iluminación

Cuando acciona el zoom, el campo visual se ilumina completamente. La intensidad luminosidad permanece constante en el lado del observador/ accesorio, evitándose por ello la molesta adaptación de los ojos de la claridad a la oscuridad.

Conexión de la iluminación

Asegúrese de que el botón giratorio está desconectado. De esta manera alarga la vida de la bombilla.

Después:
- Conecte el interruptor de red. Este y los diodos 5V y ML en el lado del aparato de control se iluminan.
- Conecte la luz con el botón giratorio y regule la intensidad luminosa.

Desconexión de la iluminación

Si procede de la siguiente manera alarga la vida de la bombilla:
- Apague primeramente la luz con el botón giratorio.
- Desconecte luego el interruptor de red.

Cambiador rápido de bombillas

Si durante la operación se funde una bombilla, gire el disco hasta que encaje la seguenda bombilla de repuesto.

La **lámpara de aviso** luce, y le recuerda que más tarde deberá colocar una nueva bombilla (pág. 49).

Filtros

Ambos usuarios pueden introducir en el divisor de rayos un portafiltros con un filtro para luz natural KB12 o un filtro verde VG9.

Use

Adjusting the dioptric setting

The dioptric correction is to be carried out precisely for both eyes.
Only then will the image stay in focus throughout the zoom range **(= parfocal).**

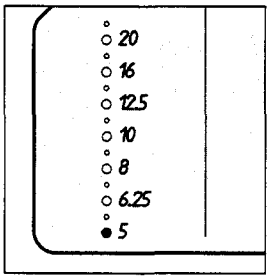
Each user need follow this procedure only once. Draw up a list for all users.

A Preparatory work

- Power switch on (page 25)
- Light on (page 25)
- Set interpupillary distance (page 23)
- Eyepiece diopter settings zero (page 24)
- Double iris diaphragm OPEN (page 35)
- RESET: basic focus position (page 17)

Is there a graticule in the eyepiece?

Go straight to section E.



B Focus on the test object

1 Zoom: 5

2 Place a flat test object beneath the objective at the working distance (see optical data, page 56)

3 Look into the eyepieces. Raise or lower the microscope until you see the object

4 Zoom: 25

5 Focus with the footswitch or handswitch F.

Utilisation

Réglage des dioptries

Les dioptries doivent être réglées de façon précise pour chaque oeil.
Ceci garantira une netteté constante lors d'un changement de grossissement **(parfocalité).**

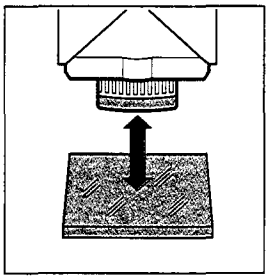
Un seul réglage est nécessaire par opérateur. Il est conseillé d'établir une liste des différents utilisateurs du microscope.

A Travaux préliminaires

- Activer l'interrupteur (page 25)
- Allumer la lumière (page 25)
- Régler l'écartement pupillaire (page 23)
- Oculaires: dioptries 0 (page 24)
- Double diaphragme iris: OPEN (page 35)
- RESET: position de base de la mise au point (page 17)

En cas d'utilisation d'un réticule,

passer à la section E.



B Mise au point sur un objet-test

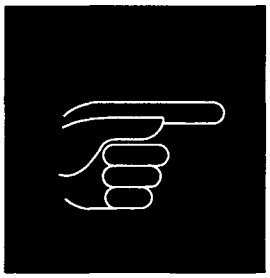
1 Zoom: 5

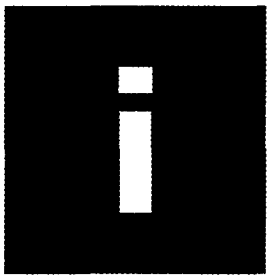
2 Placer un objet plat sous l'objectif (voir Données optiques page 56).

3 Regarder dans les oculaires. Lever/abaisser le microscope jusqu'à voir l'objet.

4 Zoom: 25

5 Faire la mise au point à l'aide de la commande à pédale/manuelle F.





Bedienung

Dioptrien einstellen

Die Dioptrien sind für beide Augen exakt einzustellen.
Nur dann bleibt die Schärfe beim Zoomen konstant = **parfokal**.

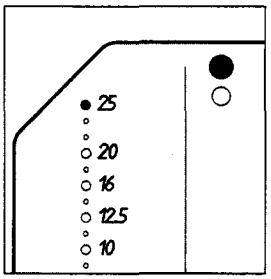
Jeder Benutzer muss diesen Vorgang nur einmal durchführen. Datenliste aller Benutzer erstellen!

A Vorbereitungen

- Netzschalter ein (S. 25)
- Licht ein (S. 25)
- Augenabstand einstellen (S. 23)
- Okulare: Dioptrien 0 (S. 24)
- Doppelirisblende: OPEN (S. 35)
- RESET: Fokus-Grundeinstellung (S. 17)

Befindet sich eine Strichplatte im Okular?

Zum Abschnitt E springen.



B Testobjekt fokussieren

1 Zoom: 5

2 Flaches Testobjekt im Arbeitsabstand (siehe Optische Daten S. 56) unter das Objektiv legen.

3 In die Okulare schauen. Mikroskop heben/senken, bis Sie das Objekt sehen.

4 Zoom: 25

5 Mit dem Fuss-/Handschalter F fokussieren.

Manejo

Ajuste de las dioptrías

Ajuste correctamente las dioptrías de los dos ojos.
Así, la nitidez permanece constante al cambiar de aumentos = **parfocal.**

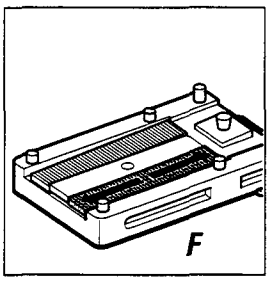
Cada usuario debe llevar a cabo este proceso sólo una vez. Haga una lista con las correcciones de todos los usuarios.

A Preparativos

- Conecte el interruptor de red (pág. 25)
- Dé la luz (pág. 25)
- Ajuste la distancia interocular (pág. 23)
- Oculares: dioptrías 0 (pág. 24)
- Diafragma iris doble: OPEN (pág. 35)
- RESET: posición básica de enfoque (pág. 17)

¿Se encuentra un retículo en el ocular?

Pase al apartado E.



B Enfocado de un objeto de ensayo

1 Zoom: 5

2 Coloque un objeto de ensayo plano debajo del objetivo. (véase Datos ópticos, pág. 56).

3 Mire a través de los oculares. Incline/levante el microscopio hasta que vea el objeto.

4 Zoom: 25

5 Enfoque con el dispositivo de control por pedal/manual F.

C Adjust the dioptric setting

6 Zoom position 5.

7 **Do not look into the eyepieces**
Turn the eyepiece mounts fully anticlockwise (+ direction). This position corresponds to +5 diopters.

8 **Look into the eyepieces**
Release the clamping screws. Slowly rotate each eyepiece in turn clockwise (direction) until both eyes see the object in sharp focus. Record the dioptric setting for each eye.

9 Reset the eyepieces to zero.
Repeat points 4–8 twice (i.e. focus at 36 and set diopters for both eyes). Now set eyepieces to the mean value.
Tighten the clamping screws.

D Inspect the parfocality

- Zoom: Position 25
- Look into the eyepieces and, if necessary, refocus minimally with the footswitch or handswitch.
- Zoom from 25 to 5.

  The image sharpness must remain constant (parfocal) at all magnifications. If it does not, then repeat the procedure described.

E Eyepiece with graticule

Prepare as in section A. Then:

- Turn the eyelens mount of the eyepiece containing the graticule fully in the "+" direction.
- Look into the eyepiece and slowly turn the eyelens mount in the "–" direction until you see the graticule sharply imaged. Secure the clamping screw.
- Go straight to section B on page 26. Adjust the setting of the eyepiece without graticule.

Do not adjust the setting of the eyepiece which contains the graticule.

C Réglage des dioptries

6 Zoom: 5

7 **Ne pas regarder dans les oculaires!**
Tourner chaque oculaire dans le sens contraire des aiguilles d'une montre (vers +) jusqu'à la butée +5.

8 **Regarder dans les oculaires.**
Desserrer les pinces à vis.. Tourner chaque oculaire lentement dans le sens des aiguilles d'une montre (vers –) jusqu'à ce que l'image de l'objet soit nette. Noter les valeus dioptriques pour chaque oeil.

9 Régler de nouveau les oculaires sur 0.
Répéter deux fois les opérations 4 à 8 (mise au point à 25×, réglage des dioptries pour chaque oeil). Régler ensuite les oculaires sur les valeurs moyennes, puis serrer les pinces à vis.

D Contrôle de la parfocalité

- Zoom: 25
- Regarder dans les oculaires et régler, si nécessaire, la netteté de l'image au moyen de la commande à pédale/manuelle.
- Passer de 25× à 5×.

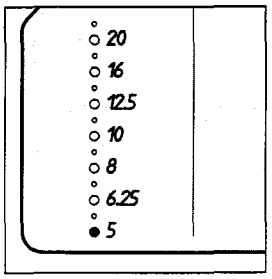
  La netteté doit rester constante lors de ce réglage (parfocalité). Dans le cas contraire, répéter les opérations précédentes.

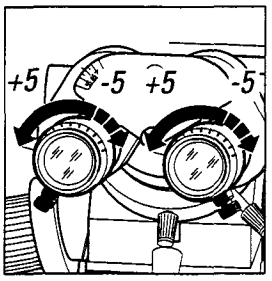
E Oculaire avec réticule

Travaux préliminaires comme section A. Ensuite:

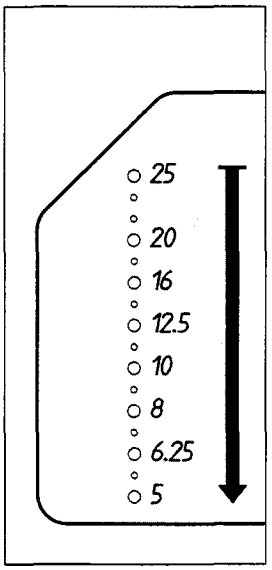
- Tourner l'oculaire avec réticule vers "+" jusqu'à la butée.
- Regarder dans l'oculaire et tourner lentement la lentille d'oeil vers "–" jusqu'à ce que l'image du réticule soit nette. Serrer la pince à vis.
- Passer à la section B, page 26. Seul l'oculaire sans réticule peut encore faire l'objet d'un réglage.

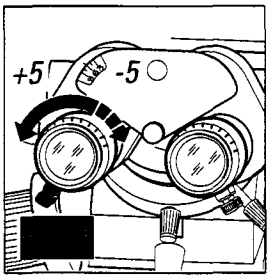
Ne plus modifier le réglage de l'oculaire muni du réticule!





Total 3x





C Dioptrien regulieren

6 Zoom: 5

7 **Nicht in die Okulare schauen!**
Okulare gegen den Uhrzeigersinn in Richtung '+' bis Anschlag drehen = +5 Dioptrien.

8 **In die Okulare schauen.**
Klemmschrauben lösen. Okulare einzeln langsam im Uhrzeigersinn in Richtung '–' drehen, bis beide Augen das Objekt scharf sehen. Werte für beide Augen notieren.

9 Okulare wieder auf 0 stellen.
Die Punkte 4–8 (Fokussieren bei 25×, Dioptrien für beide Augen einstellen) **2× wiederholen.**
Dann Mittelwerte an den Okularen einstellen.
Klemmschrauben festziehen.

D Parfokalität prüfen

- Zoom: 25
- In die Okulare schauen und falls notwendig mit dem Fuss-/Handschalter minim nachfokussieren.
- Von 25×–5× zoomen.

  Die Schärfe muss nun bei jeder Vergrösserung konstant (parfokal) bleiben. Andernfalls wiederholen Sie bitte den beschriebenen Vorgang.

E Okular mit Strichplatte

Vorbereitungen wie Abschnitt A. Dann

- Okular mit Strichplatte in Richtung '+' bis Anschlag drehen.
- In das Okular schauen und Augenlinse langsam in Richtung '–' drehen, bis Sie die Strichplatte scharf sehen.
- Klemmschraube festziehen.
- Zum Abschnitt B, S. 26, springen und wie dort beschrieben das Okular ohne Strichplatte regulieren.

Das Okular mit Strichplatte nicht mehr verstellen!

C Regulado de las dioptrías

6 Zoom: 5

7 **¡No mire a través de los oculares!**
Mueva los oculares en sentido contrario a las manecillas del reloj en dirección "+" hasta el tope = +5 dioptrías.

8 **Mire a través de los oculares**
Afloje los tornillos de apriete. Gire lentamente por separado cada uno de los oculares en sentido de las manecillas del reloj en dirección "–" hasta que el objeto se vea nítido. Apunte los valores para ambos ojos.

9 Ajuste los oculares nuevamente a 0.
Repita dos veces los puntos 4 a 8 (enfocado con 25×, ajuste de las dioptrías para ambos ojos). Ajuste seguidamente los oculares a los valores medios y apriete los tornillos.

D Control de la parfocalidad

- Zoom: 25
- Mire a través de los oculares y si se requiere reenfoque mínimamente por medio del dispositivo de control por pedal o manual.
- Lleve el zoom de 25 a 5×.
  La nitidez debe quedar constante (parfocal) en cada aumento. De lo contrario, repita el procedimiento descrito.

E Ocular con retículo

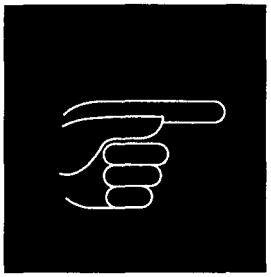
Preparativos como en apartado A. Luego

- Gire el ocular con el retículo en dirección "+" hasta el tope.
- Mire a través del ocular y gire lentamente la lente en dirección "–", hasta que vea el retículo nítidamente.
- Ajuste el tornillo de apriete.
- Vaya al apartado B, pág. 26. Regule ahora sólo el ocular sin retículo, tal y como se describe allí.

No mueva ya el ocular con retículo.

Use

Utilisation



Bedienung

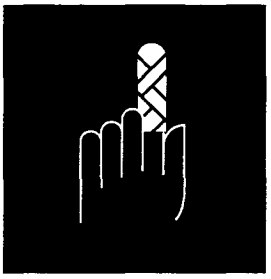
Manejo

Swingarm

Never put your fingers in the fork of the swingarm when the safety hook is not engaged.

Bras mobile

Ne jamais mettre les mains entre les barres du bras mobile lorsque le crochet est libéré.



Schwenkarm

Nie zwischen die Schwenkarmgabel greifen, wenn der Sperrhaken gelöst ist.

Brazo móvil

No meta los dedos en la apertura del brazo móvil cuando está suelto el gancho de bloqueo.

Locking the swingarm

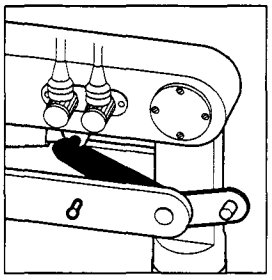
Always lock the swingarm:

- ***during transport***
- ***when changing accessories.***

Blocage du bras mobile

Ne jamais oublier de bloquer le bras mobile:

- ***pour le transport***
- ***pour changer d'accessoires***



Schwenkarm blockieren

Schwenkarm immer blockieren:

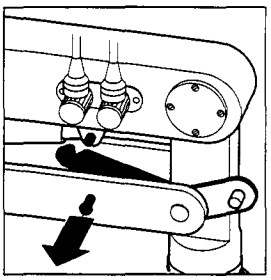
- ***beim Transport***
- ***beim Umrüsten***

Bloqueado del brazo móvil

Bloquee siempre el brazo móvil

- ***cuando vaya a transportar el equipo***
- ***cuando vaya a sustituir accesorios***

- Pull out the retaining pin
- Engage the safety hook. If necessary, raise or lower the swingarm slightly in order to align it with the safety hook.



- Tirer le goujon d'encliquetage.
- Encliqueter le crochet de retenue dans la partie supérieure du bras mobile. Le cas échéant, pousser le bras mobile vers le crochet.

- Haltebolzen ziehen.
- Sperrhaken festklinken. Dabei evtl. Schwenkarm durch leichtes Heben/Senken zum Sperrhaken führen.

- Tire del perno de sujeción.
- Encaje el gancho de bloqueo. Si resulta necesario, lleve el brazo móvil al gancho de bloqueo, inclinando/levantando para ello el brazo móvil ligeramente.

Unlocking the swingarm

Always hold the surgical microscope firmly if, when disengaging the safety hook, you are not sure whether or not the swingarm is balanced (page 23).

Déblocage du bras mobile

Tenir le microscope d'opération à la poignée de positionnement en libérant le crochet s'il n'est pas certain que le bras mobile ait été équilibré (page 23).

Blockierung lösen

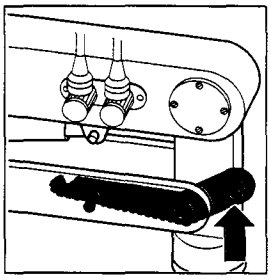
Halten Sie das Operationsmikroskop beim Öffnen des Sperrhakens am Positioniergriff fest, wenn Sie nicht sicher sind, ob der Schwenkarm ausbalanciert ist (S. 23).

Desbloqueado

Cuando abra el gancho de bloqueo sujete el microscopio de operación, de no estar seguro de si está equilibrado el brazo móvil (pág. 23).

To release the swingarm: Push the counterlever upwards until the retaining mechanism clicks into position. If the safety hook is not easily released, raise or lower the swingarm slightly.

Libérer le bras mobile: pousser le levier vers le haut jusqu'à ce que le crochet de retenue s'enclenche dans le goujon. Si le crochet reste fixé, lever ou abaisser légèrement le bras mobile.



Schwenkarm lösen: Gegenhebel nach oben drücken, bis der Sperrhaken im Haltebolzen festklinkt. Falls sich der Sperrhaken nicht löst, Schwenkarm leicht heben/senken.

Aflojado del brazo móvil: Empuje la contrapalanca hacia arriba hasta que encaje el gancho de bloqueo en el perno de sujeción. Si no se suelta el gancho, levante/incline ligeramente el brazo móvil.

Balance the swingarm each time the accessories are changed

Always balance before the operation

Never change accessories or attempt to rebalance when the microscope is over the field of operation

The 1100N gas spring (no. 433826) in the swingarm carries loads of up to 23.5kg (see page 33)

When properly balanced, the surgical microscope can be moved vertically on the swingarm through 60cm without drifting.

Equilibrage du bras mobile après chaque changement d'accessoires

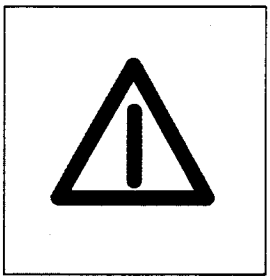
Toujours effectuer l'équilibrage avant l'opération!

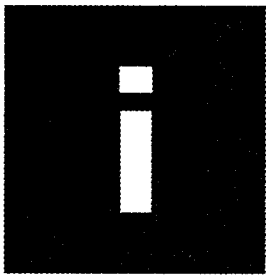
Ne jamais changer d'accessoires ni équilibrer le bras mobile au-dessus du champ opératoire!

Le ressort pneumatique 1100 N (n° 433826) du bras mobile supporte des équipements d'un poids maximal de 23,5 kg (cf. p. 33).

Une fois contrebalancé, il est possible de lever ou d'abaisser le bras mobile de 60 cm sans devoir craindre un déséquilibrage du microscope.

BALANCE





Nach jedem Zubehörwechsel: Schwenkarm ausbalancieren

Ausbalancieren immer vor der Operation!

Umrüsten des Zubehörs und Ausbalancieren des Schwenkarms nie über dem Operationsfeld!

Die Gasfeder 1100 N (Nr. 433826) im Schwenkarm trägt Ausrüstungen bis max. 23.5 kg (vgl. S. 33).

In ausbalanciertem Zustand kann das Operationsmikroskop am Schwenkarm im Bereich von 60 cm positioniert werden, ohne sich selbständig nach oben/unten zu verstellen.

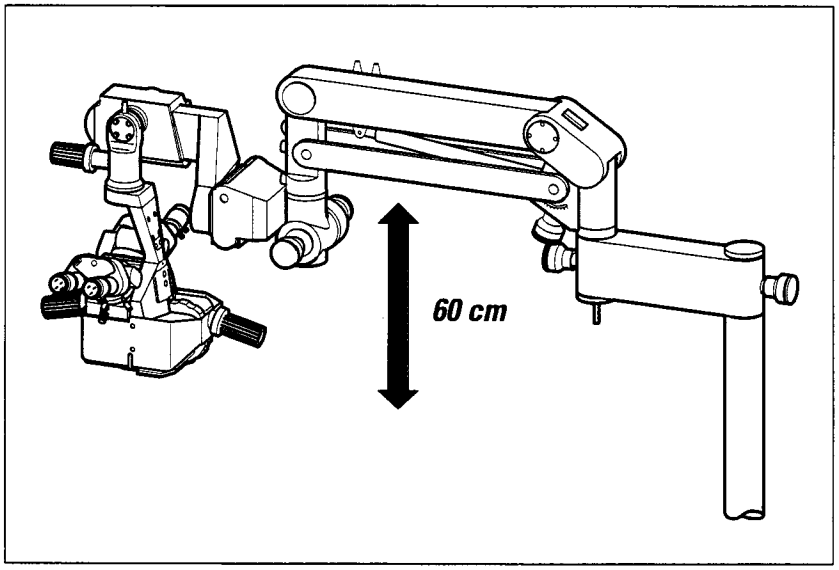
Después de cada cambio de accesorio equilibre el brazo móvil

¡Equilibre siempre antes de la operación!

¡No sustituya nunca accesorios o efectúe la compensación del peso del brazo móvil sobre el campo de operación!

El resorte 1100 N (artículo número 433 826) del brazo móvil soporta accesorios de hasta 23,5 kg. como máximo (compare pág. 33).

Una vez equilibrado, el microscopio de operación puede posicionarse sobre el brazo móvil en un margen de 60 cm sin que se suba/incline por sí solo.



Rebalancing after fitting accessories

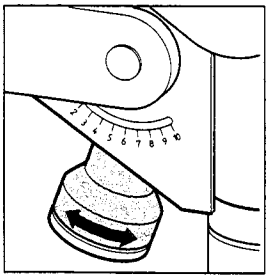
- Lock the swingarm
- Tighten all braking knobs
- Fit the accessories
- Hold the microscope with one hand. With the other, release the safety hook. See whether the swingarm drifts
- Turn the tension adjustment knob until the swingarm is balanced.

Tension scale: Low loading = low figure.

Equilibrage après changement d'accessoires

- Bloquer le bras mobile
- Serrer tous les boutons de freinage
- Monter les accessoires
- Tenir le microscope d'une main et libérer le crochet de retenue. Vérifier, en lâchant juste un moment le microscope, si le bras mobile se déplace tout seul.
- Tourner le bouton d'équilibrage jusqu'à ce que le bras soit équilibré.

Echelle: faible poids = petite valeur.



Ausbalancieren nach Zubehörwechsel

- Schwenkarm blockieren.
- Alle Bremsknöpfe festziehen.
- Zubehör montieren.
- Mikroskop mit einer Hand am Positioniergriff festhalten und Sperrhaken lösen. Testen (Mikroskop kurz loslassen), ob sich der Schwenkarm selbständig hebt/senkt.
- Drehknopf drehen, bis der Schwenkarm im Gleichgewicht ist.

Skala: Wenig Gewicht = niedriger Wert.

Equilibrado tras sustitución de accesorios

- Bloquee el brazo móvil.
- Apriete todos los botones de freno.
- Monte los accesorios.
- Sujete con una mano la empuñadura del microscopio y suelte el gancho de bloqueo. Soltando brevemente el microscopio, controle si el brazo se sube/inclina por sí solo.
- Mueva el botón giratorio, hasta que el brazo esté completamente equilibrado.

Escala: poco peso = valor pequeño.

Use

Adjusting the movements as required

Always tighten the braking knobs completely:

- ***when re-equipping***
- ***for transport.***

The three joints on the stand have braking knobs which can be adjusted for all stages from total freedom to total immobilization.

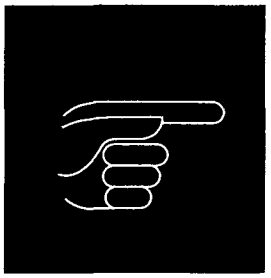
Utilisation

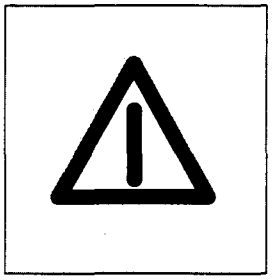
Réglage individuel de la dureté des mouvements

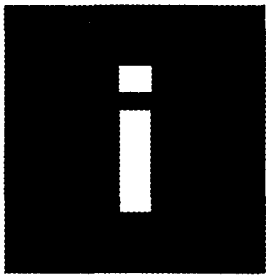
Toujours serrer les boutons de freinage:

- ***pour changer d'accessoires***
- ***pour le transport***

Les trois joints articulés sur le statif sont dotés de boutons de freinage permettant à l'utilisateur de régler le jeu jusqu'à l'arrêt complet.







Bedienung

Gangleichtigkeit der Bewegungen regulieren

Bremsknöpfe immer festziehen:

- ***beim Umrüsten***
- ***beim Transport***

Die drei Gelenke am Stativ besitzen Bremsknöpfe, mit denen der Benutzer die Stativbewegungen nach persönlichem Bedarf von leichtgängig bis zur Arretierung regulieren kann.

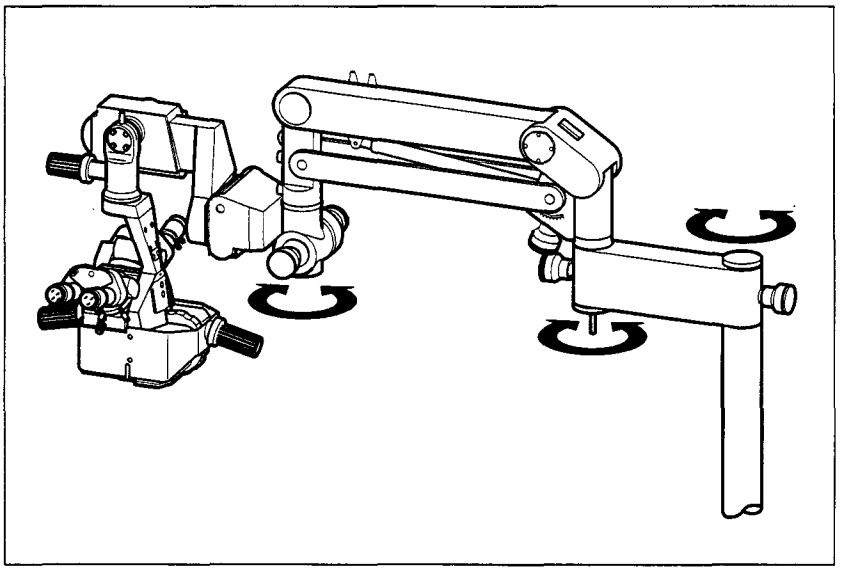
Manejo

Regulado de la suavidad de marcha de los movimientos

Apriete a fondo los botones de los frenos:

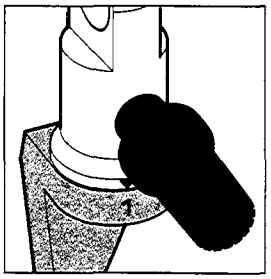
- ***al sustituir accesorios***
- ***para el transporte***

Las tres articulaciones del estativo están dotadas de botones de freno que se pueden regular individualmente desde marcha suave hasta bloqueo.



The braking knob with positioning handle
serves to retain the microscope in position 1 or 2 (page 20).

Le bouton de freinage avec poignée de positionnement
sert à maintenir le microscope en position 1 ou 2 (page 20).

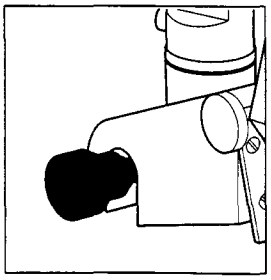


Der Bremsknopf mit Positioniergriff
dient dazu, das Mikroskop in der Stellung 1 oder 2 festzuhalten (S. 20).

El botón de freno con empuñadura de emplazamiento
sirve para retener el microscopio en la posición 1 ó 2 (pág. 20).

The orange knob
keeps the horizontal arm in the perforated plate and may **only be opened when the equipment is first installed.**

Le bouton orange
assure la fixation du porte-microscope dans le disque perforé et **ne doit être desserré que lors de l'installation initiale.**



Der orange Knopf
hält den Mikroskopträger in der Lochscheibe fest und ist **nur bei Neuinstallation** zu öffnen.

El botón anaranjado
asegura el encaje del portamicroscopio en el disco perforado y podrá aflojarse **sólo cuando se instale el equipo por primera vez.**

Use

Transport, positioning at the operating table, rest position

Transport

Important:
Adhere scrupulously to the following directions. This will prevent the swingarm from moving sideways out of control and perhaps causing the floor stand to tip over.

- **Release the securing bolt and engage the safety hook**
- **Slacken the articulation brakes and fold up the swingarm as shown in the picture**
- **Tighten the articulation brakes**

- Put the footswitch into its holder
- Pull out the power cable from the socket and fold it up
- Release the footbrakes by pressing on the foot levers
- Use the handles to move the stand to its working location
- Now press the footbrakes to engage them.

Positioning the stand at the operating table

For maximum mobility:

- the pivotal point on the extension arm must be over the field of operation, and
- the articulation of the swingarm must be at a slight lateral angle.

Rest position

- Lock the swingarm as described above, fold it, and tighten the articulation brakes
- Place the footswitch into its holder
- Fit the dust caps and the dust covers.

Utilisation

Transport, positionnement par rapport à la table d'opération et rangement

Transport

Il est important de suivre à la lettre les instructions mentionnées ci-dessous. Vous éviterez ainsi le balancement involontaire du bras mobile et le basculement du statif de sol.

- **Tirer le goujon d'encliquetage pour que le crochet de retenue bloque le bras mobile.**
- **Desserrer les boutons de freinage et replier le bras mobile comme indiqué sur l'illustration**
- **Resserrer les boutons de freinage.**

- Mettre la commande à pédale dans le support.
- Tirer le câble réseau de la prise de courant.
- Appuyer sur les leviers des pédales de frein pour débloquer les roulettes du statif.
- Rouler le statif en le tenant aux poignées.
- Appuyer sur les pédales de frein.

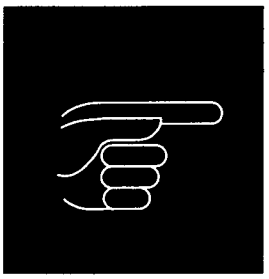
Positionnement par rapport à la table d'opération

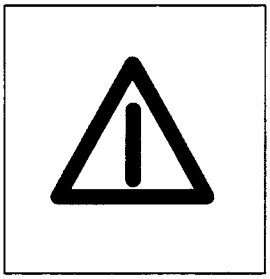
La parfaite mobilité est garantie lorsque

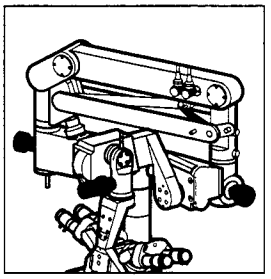
- le point de pivotement du microscope se trouve au-dessus du champ opératoire et
- le bras mobile est légèrement plié.

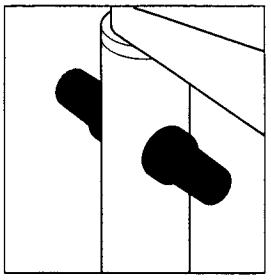
Rangement

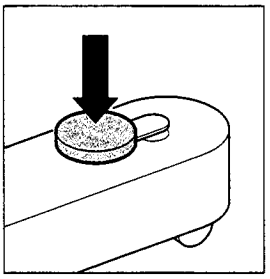
- Bloquer le bras mobile comme indiqué ci-dessus, le plier et serrer les boutons de freinage.
- Placer la commande à pédale dans le support.
- Mettre les couvercles antipoussière et recouvrir l'instrument.

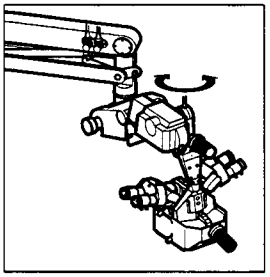


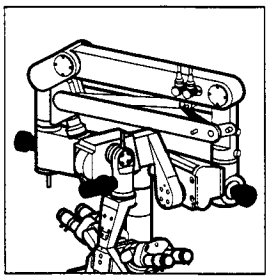












Bedienung

Transport, Plazierung am OP-Tisch und Ruhestellung

Transportieren

Wichtig: Halten Sie sich exakt an die folgenden Anweisungen. Dadurch vermeiden Sie ein unkontrolliertes Ausschwenken des Schwenkarms und damit ein mögliches Kippen des Bodenstativs.

- **Haltebolzen ziehen und Sperrhaken festklinken.**
- **Gelenkbremsen öffnen und Schwenkarm gemäss Bild zusammenfalten.**
- **Gelenkbremsen festziehen.**

- Fussschalter an den Träger hängen.
- Netzkabel aus der Steckdose ziehen und zusammenlegen.
- Auf die Fusshebel treten, um die Fussbremsen zu lösen.
- Stativ an den Griffen zum gewünschten Ort schieben.
- Fussbremsen festtreten.

Plazieren am OP-Tisch

Die maximale Beweglichkeit ist gewährleistet, wenn

- sich der Mikroskop-Drehpunkt über dem Operationsfeld befindet und
- der Schwenkarm leicht abgewinkelt ist.

Ruhestellung

- Schwenkarm wie oben blockieren, zusammenfalten und Gelenkbremsen festziehen.
- Fussschalter an den Träger hängen.
- Staubdeckel und Staubschutzhülle anbringen.

Manejo

Transporte, emplazamiento en la mesa de operación y posición en reposo

Transporte

Observación: aténgase a las instrucciones siguientes. Con ello evita giros incontrolados del brazo móvil y por consiguiente un posible vuelco del estativo.

- **Tire del perno de sujeción y encaje el gancho de bloqueo.**
- **Suelte los frenos de articulación y pliegue el brazo móvil tal y como se muestra en el dibujo.**
- **Apriete fuertemente los frenos de articulación.**

- Coloque el dispositivo de control por pedal en el soporte.
- Desenchufe el cable de red y enróllelo debidamente.
- Pise las palancas para soltar los frenos de pedal.
- Tome los mangos para desplazar el estativo al destino requerido.
- Pise los frenos.

Emplazamiento junto a la mesa de operación

La movilidad máxima está garantizada cuando

- el punto de giro del microscopio está situado sobre el campo de operación
- y el brazo móvil está ligeramente angulado.

Posición de reposo

- Bloquee el brazo como se ha descrito arriba, pliéguelo y apriete los frenos de articulación.
- Coloque el dispositivo de control por pedal en el soporte.
- Coloque la tapa y la funda protectoras.

Use

Sterile controls

The controls can be fitted with steam-sterilizable handles and covers. Use the sterilizable handles also when you use sterile disposable drapes. The controls will be easier to grasp.

Sterilization

All attachable polymer components such as positioning handles and lever extensions are steam- or gas-sterilizable.

Never use formic acid for sterilization.

Clip-on handles

Fitting:
The clip-on handles engage when pushed over the metal handle axles on the microscope or on the microscope carrier.

Removing:
Press the axial button.

Lever extension

for the double-iris diaphragm on the beam splitter.

Cover

for the binocular tube with variable angle of observation 0°-180°.

Do not use this cover beneath the sterile drape.

Lever extension and transparent cover

respectively for use with double-iris diaphragm and with interpupillary drive knob of straight and inclined binocular tubes when used with stereo attachment for second observer.

Utilisation

Eléments de commande stérilisables

Vous pouvez recouvrir les éléments de commande avec des gaines et des poignées stérilisables à l'autoclave. Ces dernières sont aussi conseillées lorsque vous utilisez des housses stériles à jeter après usage.

Stérilisation

Tous les composants en matière synthétique tels que les poignées de positionnement et le levier de diaphragme sont stérilisables à l'autoclave ou au gaz.

Ne jamais utiliser d'acide formique!

Poignées de positionnement

Mise en place:
Faire glisser les poignées sur les porte-poignées du microscope et du porte-microscope jusqu'à ce qu'elles s'enclenchent automatiquement par déclic.

Retrait:
Libérer le verrouillage à déclic par pression.

Rallonge de levier

à mettre sur le levier du double diaphragme iris sur le répartiteur optique.

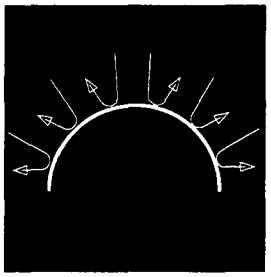
Gaine

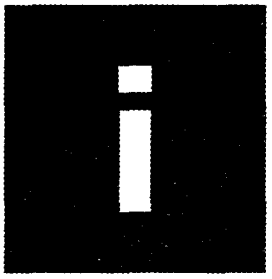
à mettre sur le tube binoculaire à angle d'observation variable 180°.

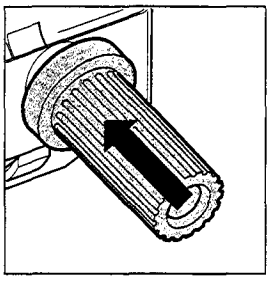
A ne pas utiliser sous la housse stérile.

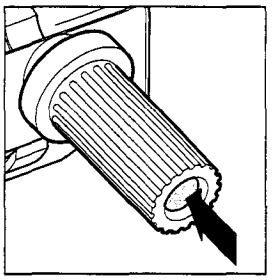
Rallonge du levier et gaine

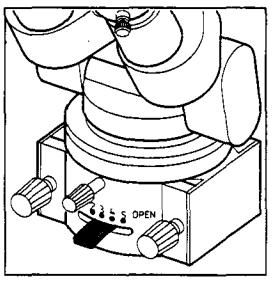
pour le double diaphragme iris et le réglage de l'écartement pupillaire sur le tube binoculaire incliné et le tube droit (pour la rallonge stéréo pour deuxième observateur).

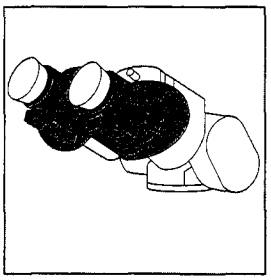


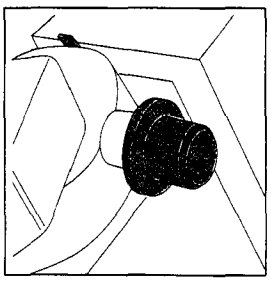












Bedienung

Sterile Bedienungselemente

Die Bedienungselemente können mit dampfsterilisierbaren Griffen und Abdeckungen versehen werden. Bringen Sie die Griffe auch dann an, wenn Sie sterile Einweghüllen benutzen. Die Bedienungselemente sind dann griffiger.

Sterilisation

Alle aufsteckbaren Kunststoffkomponenten wie z.B. Positioniergriffe und und Blendenhebel sind dampf- oder gassterilisierbar.

Sterilisieren Sie nie mit Ameisensäure!

Positioniergriffe

Aufsetzen:
Positioniergriffe über die Griffhalterungen am Mikroskop und am Mikroskopträger schieben. Sie rasten mittels Schnappverschluss automatisch ein.

Abnehmen:
Schnappverschluss durch Druck lösen.

Hebelverlängerung

für die Doppelirisblende am Strahlenteiler auf dem Hebel feststecken.

Abdeckung

für den Binokulartubus mit variablem Einblickwinkel 180° über die Tubusrohre schieben.

Abdeckungen nicht unter der Sterilhülle benutzen.

Hebelverlängerung und Drehknopf

für Doppelirisblende und Augenabstandsversteller am binokularen Schrägtubus und Geradtubus (beim Stereo-Mitbeobachteransatz) feststecken.

Manejo

Elementos de mando esterilizables

Puede adaptar empuñaduras y fundas esterilizables con vapor en todos los elementos de control del microscopio. Coloque estas empuñaduras aunque vaya a utilizar cubiertas estériles desechables, pues de esta manera los elementos de control del instrumento son más fáciles de agarrar.

Esterilización

Todos los componentes de plástico insertables como las palancas de diafragma y las empuñaduras permiten esterlizarse con gas o vapor.

¡No esterilice nunca con ácido fórmico!

Empuñaduras

Montaje:
Deslice las empuñaduras por los soportes del microscopio y el portamicroscopio. Estas encajan automáticamente mediante cierre a presión.

Desmontaje:
Haga presión sobre la empuñadura para que salga.

Prolongación de la palanca

Introduzca este elemento en la palanca para el diafragma iris doble en el divisor de rayos.

Funda

Encájese en el tubo binocular con ángulo de observación variable 180°.

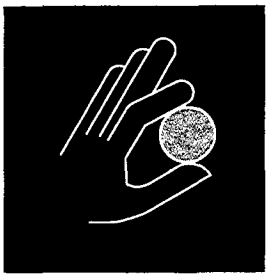
No utilice las fundas debajo de la fundas estéril.

Prolongación de la palanca y funda para el botón giratorio

Para el diafragma iris doble y el regulador de la distancia interpupilar en los tubos binoculares (en el dispositivo es estereoscópico para observación simultánea) recto e inclinado.

Accessories Table of weights

Accessoires Poids



Zubehör Gewichtstabelle

Accesorios Tabla de pesos

WILD M680 complete standard outfit:

with microscope, microscope carrier, stereo modules (1 short and 1 long), 2 tube adapters, 2 variable binocular tubes, 4 eyepieces 10xB, and f=250mm objective

WILD M680 Equipement standard complet:

avec microscope, porte-microscope, modules stéréo (1 court et 1 long), 2 bagues intermédiaires tournantes, 2 tubes binoculaires à angle variable, 4 oculaires 10xB et objectif f=250 mm

20640 g

WILD M680 komplette Standardausrüstung:

mit Mikroskop, Mikroskopträger, Stereo-Modulen (1× kurz und 1× lang), 2 Tubuszwischenstücken, 2 variablen Binokulartuben, 4 Okularen 10×B und Objektiv f = 250 mm

Equipo completo del WILD M680:

con microscopio, porta-microscopio, módulos estereoscópicos (1 corto, 1 largo), 2 piezas intermedias giratorias, 2 tubos binoculares variables, 4 oculares 10xB y objetivo = 250 mm

Example of additional combination of accessories:
Beam splitter, dual adapter with f=107mm TV adapter, Sony TV camera DXC107, f=350mm photo adapter, and Leica camera with motor winder

Exemple d'accessoires supplémentaires:
Répartiteur optique, double rallonge photo et TV avec adaptateur TV f=107 mm, caméra TV Sony DXC 107, adaptateur photo f=350 mm et appareil photo Leica avec transport de film à moteur

3027 g

Beispiel für zusätzliches Zubehör:
Strahlenteiler, Dualansatz mit TV-Adapter f=107 mm, Sony TV-Kamera DXC 107, Photo-Adapter f=350 mm und Leica-Kamera mit Motorwinder

Ejemplo con accesorios adicionales:
divisor de rayos, suplemento dual con adaptador de TV f = 107 mm, cámara de TV Sony DXC 107, adaptador fotográfico f = 350 mm y cámara Leica con bobina a motor

Accessories	Accessoires		Zubehör	Accesorios
Stereo module, short	Module stéréo court	**520 g**	Stereo-Module, kurz	Módulo estereoscópico, corto
Stereo module, long	Module stéréo long	**630 g**	Stereo-Module, lang	Módulo estereoscópico, largo
Beam splitter	Répartiteur optique	**550 g**	Strahlenteiler	Divisor de rayos
Dual attachment	Double rallonge photo et TV	**880 g**	Dualansatz	Suplemento dual
TV objectives f=60mm and f=85mm for dual attachment	Adaptateur TV f=60 mm et f=85 mm pour double rallonge photo et TV	each/chacun/je/cada uno **100 g**	TV-Adapter f = 60 mm und f = 85 mm zu Dualansatz	Adaptador de TV f = 60 mm y f = 85 mm, para suplemento dual
TV objective f=107mm for dual attachment	Adaptateur TV f=107 mm pour double rallonge photo et TV	**110 g**	TV-Adapter f =107 mm zu Dualansatz	Adaptador de TV f = 107 mm, para suplemento dual
Photo objective f=250mm for dual attachment	Adaptateur photo f=250 mm pour double rallonge photo et TV	**64 g**	Photo-Adapter f = 250 mm zu Dualansatz	Adaptador fotográfico f = 250 mm, para suplemento dual
Photo objective f=350mm for dual attachment	Adaptateur photo f=350 mm pour double rallonge photo et TV	**167 g**	Photo-Adapter f = 350 mm zu Dualansatz	Adaptador fotográfico f = 350 mm, para suplemento dual
Sony TV camera DXC 107	Caméra TV Sony DXC 107	**360 g**	TV-Kamera Sony DXC 107	Cámara TV Sony DXC 107
Edixa	Edixa	**690 g**	Edixa	Edixa
Leica with motor winder	Appareil photo Leica avec transport de film à moteur	**960 g**	Leica mit Motorwinder	Leica con bobina a motor
Phototube	Rallonge photo	**600 g**	Photoansatz	Suplemento para fotografía
Adapter f=250mm for phototube	Adaptateur f=250 mm pour rallonge photo	**70 g**	Adapter f = 250 mm zu Photoansatz	Adaptador f = 250 mm, para suplemento para fotografía
Adapter f=350mm for phototube	Adaptateur f=350 mm pour rallonge photo	**170 g**	Adapter f = 350 mm zu Photoansatz	Adaptador f = 350 mm, para suplemento para fotografía
Cine/TV tube f=107mm	Rallonge ciné/TV avec adaptateur f=107 mm	**790 g**	Kino-/TV-Ansatz mit Adapter f=107 mm	Suplemento cine/TV con adaptador f = 107 mm
Stereo attachment for second observer	Rallonge stéréo pour deuxième observateur	**1480 g**	Stereo-Mitbeobachter-ansatz	Dispositivo estereoscópico para observación simultánea
Straight binocular tube with drive	Tube droit avec commande	**600 g**	Geradtubus mit Trieb	Tubo recto con botón de ajuste
Inclined binocular tube with drive	Tube incliné avec commande	**660 g**	Schrägtubus mit Trieb	Tubo inclinado con botón de ajuste
Inclined binocular tube, 45°	Tube binoculaire incliné 45°	**567 g**	Binokulartubus, schräg, 45°	Tubo binocular inclinado, 45°
Wide-field eyepiece for spectacle wearers 10×B	Oculaire grand-angulaire pour porteurs de lunettes 10×B	**110 g**	Weitwinkel-Brillenträger-okular 10×B	Ocular granangular para observar con gafas 10×B
Second observer tube, long	Tube long pour deuxième observateur	**1250 g**	Mitbeobachtertubus, lang	Tubo para segundo observador, largo

Accessories

Beam splitter

No more than 3.1kg of accessories, including the beam splitter, may be fitted (see page 33).

Never change accessories when the microscope is over the field of operation.

Rebalance the swingarm each time that you change the accessories (page 29).

Fitting

The beam splitter can be fitted for either of the two observers.

Preparatory work

- Lock the swingarm (page 28)
- Tighten the articulation brakes (page 30)
- Release the clamping screw on the microscope. Remove the binocular tube and, if it is present, the ±30° rotatable tube adapter (page 48).

Fitting the beam splitter

Always fit the beam splitter on top of the stereo modules.

- Introduce the beam splitter into the dovetail ring of the stereo module and turn it slightly so that the locating screw engages the guide groove
- Secure the clamping screw
- Secure the ±30° tube adapter and the binocular tube to the beam splitter in the same manner. Secure the clamping screw.

Accessoires

Répartiteur optique

Le poids des accessoires supplémentaires ne doit pas dépasser 3,1 kg avec le répartiteur optique (voir page 33).

Ne jamais changer d'accessoires au-dessus du champ opératoire!

Equilibrer le microscope et le bras mobile après chaque changement d'accessoires (page 29).

Montage

Le répartiteur optique peut être utilisé des deux côtés observateur.

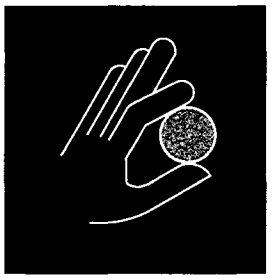
Préliminaires

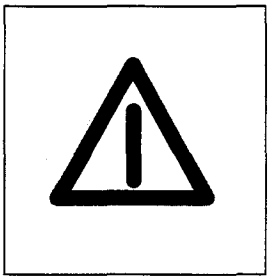
- Bloquer le bras mobile (page 28)
- Serrer les boutons de freinage (page 30)
- Desserrer la pince à vis du module stéréo. Retirer le tube binoculaire avec bague intermédiaire tournante 30°(p. 48).

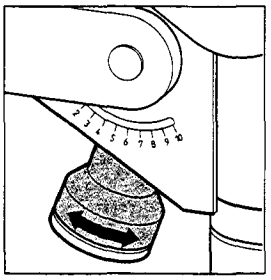
Montage du répartiteur optique

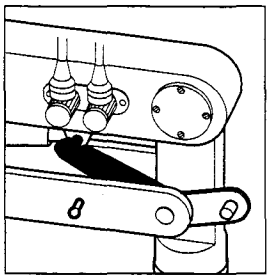
Toujours fixer le répartiteur optique sur les modules stéréo.

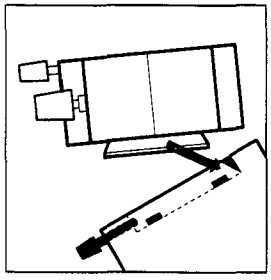
- Introduire le répartiteur optique dans la queue d'aronde sur le module stéréo et le tourner légèrement jusqu'à ce que la vis d'orientation s'enclenche dans la glissière.
- Serrer les pinces à vis.
- Procéder de la même façon pour fixer la bague intermédiaire 30° avec tube binculaire sur le répartiteur optique. Serrer la pince à vis.

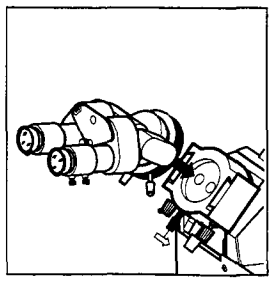












Zubehör

Strahlenteiler

Die Zuladung von Zubehör ist auf max. 3,1 kg (mit Strahlenteiler) begrenzt (siehe S. 33).

Umrüsten nie über dem Operationsfeld!

Nach jedem Zubehörwechsel Schwenkarm ausbalancieren (S. 29).

Montage

Der Strahlenteiler kann auf beiden Beobachterseiten benutzt werden.

Vorbereitungen

- Schwenkarm blockieren (S. 28).
- Gelenkbremsen festziehen (S. 30).
- Klemmschraube am Stereo-Modul lösen. Binokulartubus mit 30° Tubuszwischenstück abnehmen (S. 48).

Strahlenteiler montieren

Strahlenteiler immer auf den Stereo-Modulen befestigen.

- Strahlenteiler in die Ringschwalbe auf dem Stereo-Modul schieben und seitlich leicht verdrehen, bis die Orientierungsschraube in die Führung greift.
- Klemmschraube festziehen.
- Tubuszwischenstück 30° mit Binokulartubus auf dieselbe Weise auf dem Strahlenteiler befestigen. Klemmschrauben festziehen.

Accesorios

Divisor de rayos

La carga de accesorios está limitada a 3,1 kg como máximo (con divisor de rayos) (veáse pág. 33).

¡No sustituya nunca accesorios sobre el campo de operación!

Después de cada cambio de accesorio equilibre el brazo móvil y el microscopio de operación (pág. 29).

Montaje

El divisor de rayos puede utilizarse en ambos lados del observador.

Preparativos

- Bloquee el brazo móvil (pág. 28).
- Apriete los frenos de articulación (pág. 30).
- Afloje el tornillo de apriete del módulo estereoscópico.
- Retire el tubo binocular con la pieza intermedia giratoria ±30° (pág. 48).

Montaje del divisor de rayos

Monte el divisor siempre en los módulos estereoscópicos.

- Introduzca el divisor de rayos en la cola de milano del módulo estereoscópico y gírelo ligeramente hacia ambos lados hasta que esté correctamente encajado.
- Apriete el tornillo.
- Proceda de la misma manera para fijar en el divisor de rayos el tubo binocular con la pieza intermedia giratoria ±30°. Apriete los tornillos.

Fitting accessories

The two lateral outlets of the beam splitter can be used simultaneously for different tasks.

Respect the weight limit (see page 34)!

- Release the clamping screw at the left or right lateral outlet and remove the black cover plate
- Carefully fit the second observer tube, the phototube, the cine/TV tube or the dual attachment, and tighten the clamping screw
- Balance the swingarm (page 28).

Depth of field

You can increase the depth of field with the double-iris diaphragm, which influences the observation tube and both lateral outlets.

Move the lever from OPEN in the direction of 1. The depth of field increases.

Mise en place des accessoires

Les deux sorties latérales du répartiteur optique peuvent servir simultanément à différentes applications.

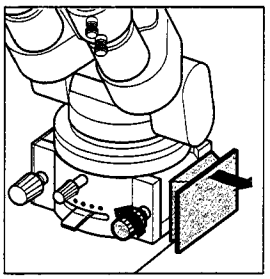
Attention au poids total (voir p. 34)!

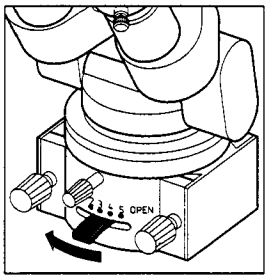
- Desserrer la pince à vis de la sortie gauche ou droite, puis retirer la plaque noire.
- Mettre en place le tube pour deuxième observateur, la rallonge photo/TV ou la double rallonge photo et TV. Serrer la pince à vis.
- Equilibrer le bras mobile (page 28).

Profondeur de champ

Le double diaphragme iris augmente la profondeur de champ et agit sur le tube d'observation et les deux sorties latérales.

La profondeur de champ se règle à l'aide du levier; l'augmentation maximum s'obtient en position 1.





Zubehör montieren

Die beiden seitlichen Ausgänge des Strahlenteilers können gleichzeitig für verschiedene Aufgaben genutzt werden.

Gesamtgewicht beachten (siehe S. 34)!

- Klemmschraube am linken oder rechten Ausgang lösen und schwarze Staubschutzplatte abnehmen.
- Mitbeobachtertubus, Photo-, TV- oder Dualansatz sorgfältig einsetzen und Klemmschraube festziehen.
- Schwenkarm ausbalancieren (S. 28)

Schärfentiefe

Mit der Doppelirisblende können Sie die Schärfentiefe steigern. Sie wirkt auf den Beobachtertubus und die beiden seitlichen Ausgänge.

Hebel von OPEN in Richtung 1 schieben. Dabei nimmt die Schärfentiefe zu.

Montaje de los accesorios

Las dos salidas laterales del divisor de rayos pueden utilizarse simultáneamente para diferentes accesorios.

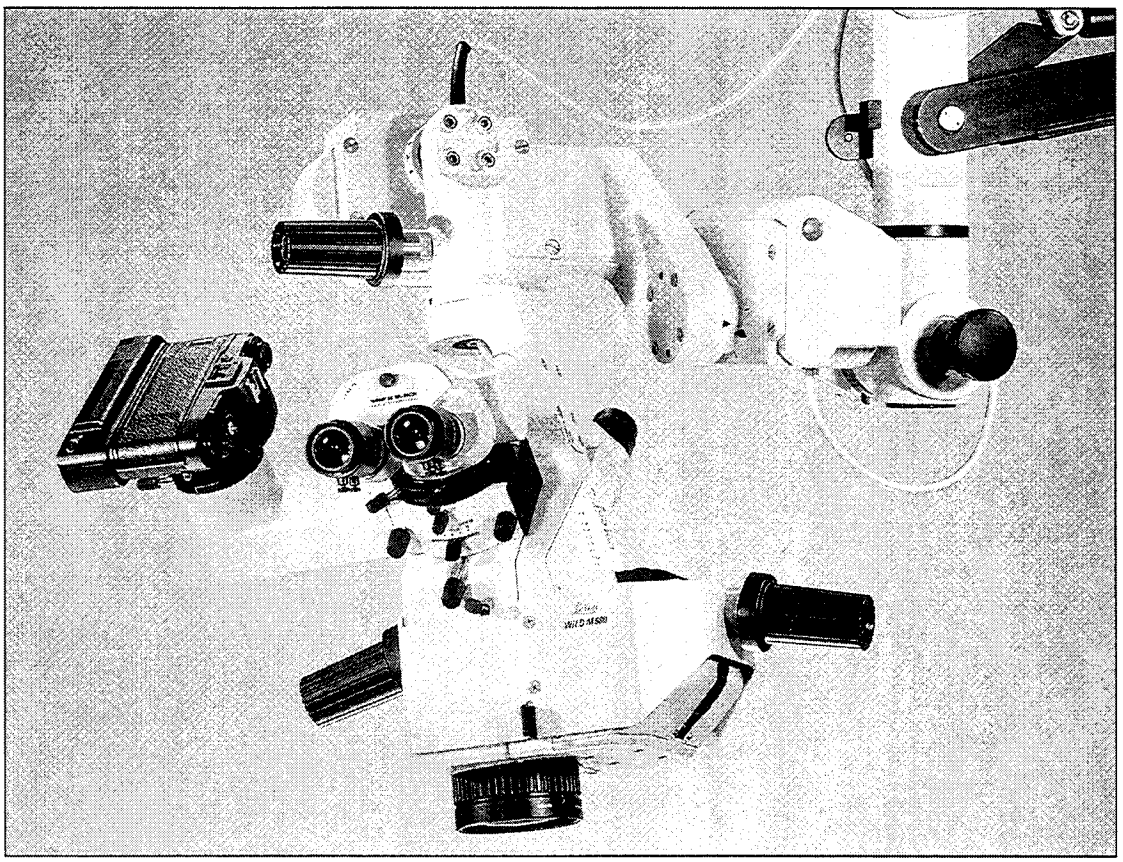
¡Observe la tabla de pesos en pág. 34!

- Afloje el tornillo de apriete de una de las dos salidas laterales y retire la placa negra.
- Monte con cuidado el tubo de observación simultánea, el suplemento para fotografía, el de TV o el dual y apriete el tornillo.
- Equilibre el brazo móvil (pág. 28).

Profundidad de campo

El diafragma iris doble permite aumentar la profundidad de campo y actúa sobre el tubo binocular y las dos salidas laterales.

Para incrementar la profundidad de campo, lleve la palanca de OPEN en dirección 1.



Beam splitter with phototube and Leica camera

Répartiteur optique avec rallonge photo et appareil photo Leica

Strahenteiler mit Photoansatz und Leica-Kamera

Divisor de rayos con suplemento fotográfico y cámara Leica

Accessories

Dual-station viewing

The stereo attachment for a second observer, and the second-observer tubes, can be turned as required, and so the image can be orientated in accordance with the direction of observation.

Second-observer tubes

- Fit the second-observer tube to the beam splitter (page 35)
- Insert the eyepiece.

The assistant

- turns the attachment to the direction required
- corrects the dioptric settings
- uses the knurled ring to erect the image.

Accessoires

Observation simultanée

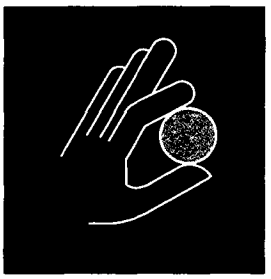
La rallonge stéréo pour deuxième observateur et les tubes d'observation peuvent être orientés au gré de l'utilisateur qui a ainsi la possibilité de redresser l'image en fonction de son axe d'observation.

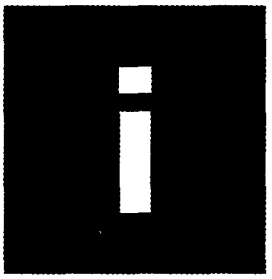
Tube pour deuxième observateur

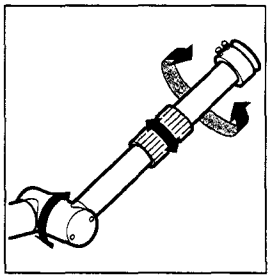
- Monter le tube pour deuxième observateur sur le répartiteur optique (page 35).
- Mettre les oculaires.

L'assistant

- tourne ce tube dans la direction voulue
- corrige ses dioptries sur l'oculaire
- redresse l'image à l'aide de l'anneau moleté







Zubehör

Mitbeobachtung

Der Stereo-Mitbeobachteransatz und die Mitbeobachtertuben können beliebig verdreht werden. Das Bild kann dann entsprechend der Einblickrichtung aufgerichtet werden.

Mitbeobachtertuben

- Mitbeobachtertubus am Strahlenteiler montieren (S. 35).
- Okular einsetzen.

Der Assistent

- dreht den Tubus in die gewünschte Richtung.
- stellt seine Dioptrie am Okular ein
- richtet das Bild mit dem Rändelring auf.

Accesorios

Observación simultánea

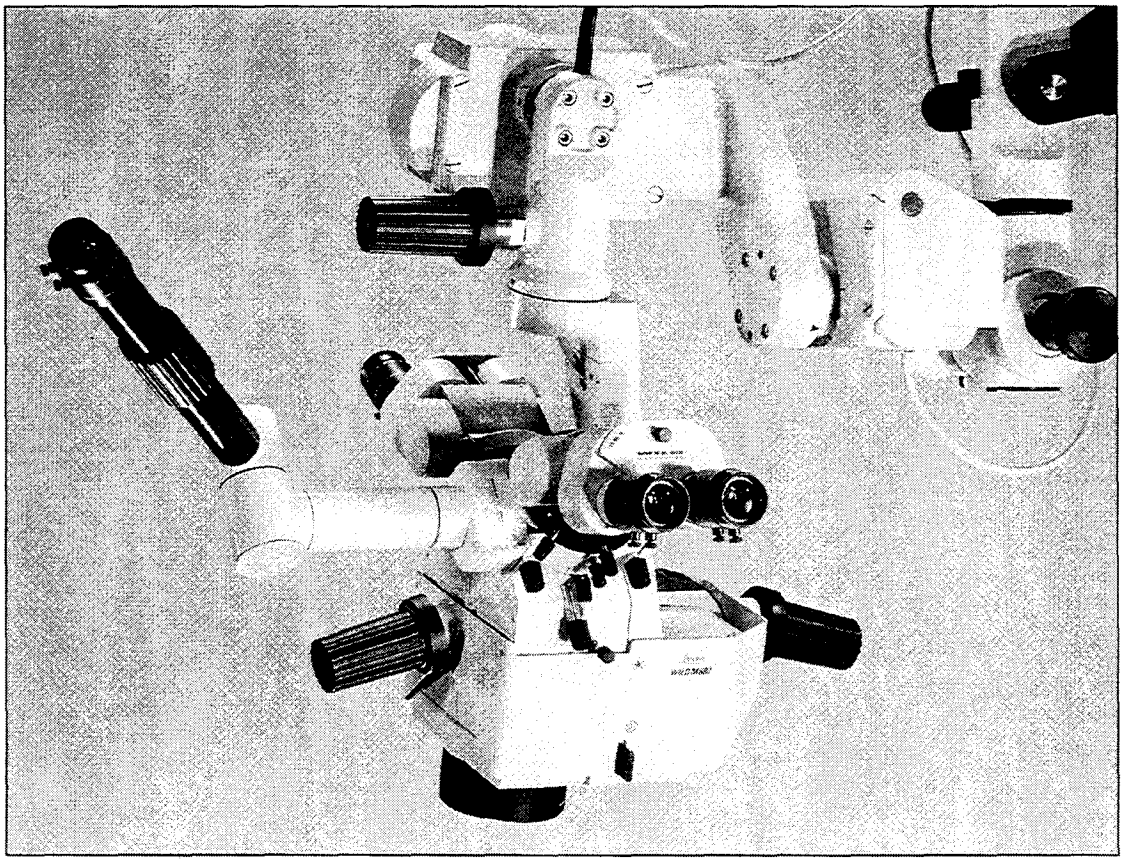
Los tubos para segundo observador y el dispositivo estereoscópico para la observación simultánea pueden girarse a voluntad. Así, la imagen se orienta de acuerdo a la dirección de observación.

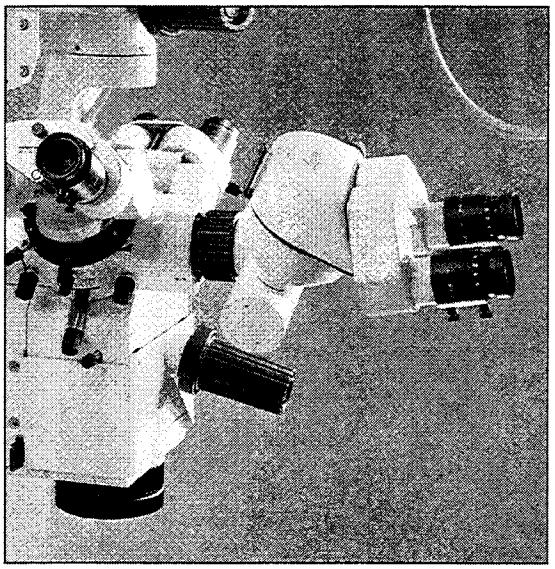
Tubos para segundo observador

- Monte el tubo para segundo observador en el divisor de rayos (pág. 35).
- Acople el ocular.

El asistente

- gira el tubo en la dirección deseada
- ajusta sus dioptrías en el ocular
- orienta la imagen con el anillo moleteado.





Stereo attachment for a second observer

- Fit the stereo attachment to the beam splitter on the left or right side (page 35)
- Fit the binocular tube
- Insert the eyepieces.

The assistant

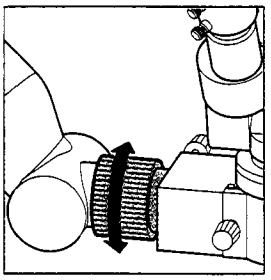
- turns the attachment to the direction required
- turns the binocular tube to the horizontal position
- sets the interpupillary distance
- corrects the dioptric settings on the eyepieces
- uses the knurled ring to erect the image.

Rallonge stéréo pour deuxième observateur

- Monter la rallonge à gauche ou à droite du répartiteur optique (page 35).
- Fixer le tube binoculaire.
- Mettre les oculaires.

L'assistant

- tourne ce tube dans la direction voulue
- met le tube binoculaire à l'horizontale
- règle son écartement pupillaire
- corrige ses dioptries sur les oculaires
- redresse l'image à l'aide de l'anneau moleté



Stereo-Mitbeobachteransatz

- Ansatz links oder rechts am Strahlenteiler montieren (S. 35).
- Binokulartubus befestigen.
- Okulare einsetzen.

Der Assistent

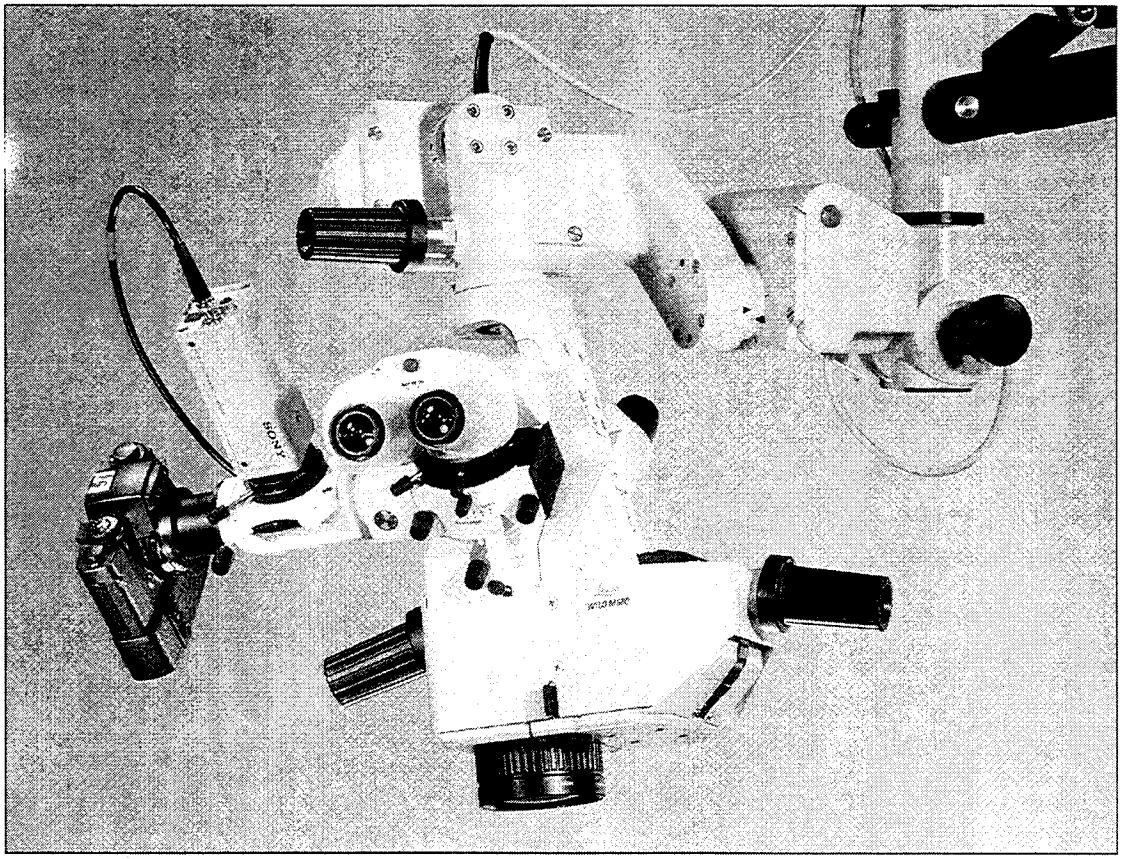
- dreht den Ansatz in die gewünschte Richtung.
- richtet den Binokulartubus horizontal aus.
- stellt seinen Augenabstand ein.
- stellt seine Dioptrien an den Okularen ein.
- richtet das Bild mit dem Rändelring auf.

Dispositivo estereoscópico para la observación simultánea

- Monte el dispositivo a la izquierda o la derecha en el divisor de rayos (pág. 35).
- Asegure el tubo binocular.
- Acople los oculares.

El asistente

- gira el dispositivo en la dirección requerida
- coloca el tubo binocular horizontalmente
- fija su distancia interocular
- ajusta sus dioptrías en los oculares
- orienta la imagen con el anillo moleteado.



Beam splitter with dual attachment and with Leica- and video cameras

Répartiteur optique avec double rallonge, appareil photo Leica et vidéo

Strahlenteiler mit Dualansatz, Leica- und Video-Kamera

Divisor de rayos con suplemento dual, cámara Leica y videocámara

Accessories

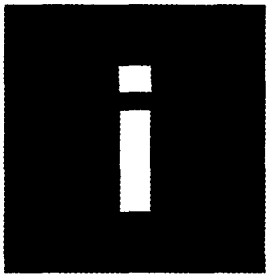
Dual attachment for photography and for cine/TV

The dual attachment accepts a commercially-available TV camera with C-mount and an SLR camera at the same time. (Photo on page 37).

Accessoires

Double rallonge pour photo et TV/ciné

Cette rallonge est prévue pour recevoir en même temps une caméra TV à filetage C et un appareil reflex (photo p. 37).



Zubehör

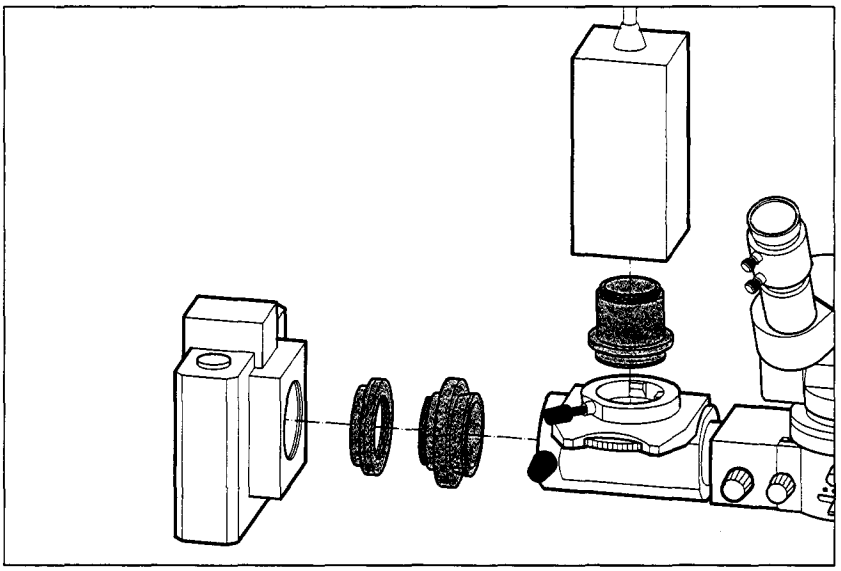
Dualansatz für Photographie und TV/Kino

Der Dualansatz nimmt gleichzeitig eine handelsübliche TV-Kamera mit C-Gewinde und eine Spiegelreflexkamera auf (Abbildung S. 37.)

Accesorios

Suplemento dual para fotografía y TV/cine

En el suplemento dual pueden montarse simultáneamente una cámara de TV corriente con rosca C y una cámara réflex (véase fotografía pág. 37).



Fitting

1 Dual attachment

Fit the dual attachment to the beam splitter (page 35)

2 TV camera

- Screw the TV objective into position
- Fit the camera to the dual attachment
- Tighten the clamping screw.

3 35mm SLR camera

- Screw the camera adapter into position
- Screw the camera objective to the camera adapter
- Connect the camera to the dual attachment
- Tighten the clamping screw.

4 Align the TV camera

- Release the clamping screw (a)
- Engage the TV camera at one of the 45° steps in accordance with the space available
- Tighten the clamping screw.

Montage

1 Fixer la double rallonge

sur le répartiteur optique (page 35).

2 Caméra TV

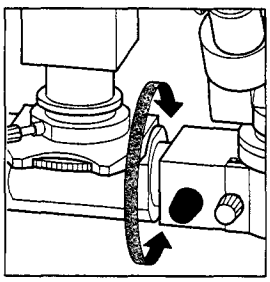
- Visser l'objectif TV
- Placer la caméra dans la rallonge
- Serrer la pince à vis

3 Appareil photo

- Visser l'adaptateur de chambre
- Visser l'objectif photo sur l'adaptateur de chambre
- Mettre l'appareil dans la rallonge
- Serrer la pince à vis

4 Positionner la caméra TV

- Desserrer la pince à vis (a)
- Selon la place disponible, positionner la caméra TV dans l'un des crans à 45°
- Serrer la pince à vis



Montage

1 Dualansatz

am Strahlenteiler befestigen (S. 35).

2 TV-Kamera

- TV-Objektiv festschrauben.
- Kamera im Dualansatz einsetzen.
- Klemmschraube festziehen.

3 Photo-Kamera

- Kameraadapter an der Kamera festschrauben.
- Photo-Objektiv am Kameraadapter festschrauben.
- Kamera im Dualansatz einsetzen.
- Klemmschraube festziehen.

4 TV-Kamera ausrichten

- Klemmschraube (a) lösen.
- TV-Kamera je nach Platzverhältnissen in einem der 45°-Schritte einrasten.
- Klemmschraube festziehen.

Montaje

1 Fije el suplemento dual

en el divisor de rayos (pág. 35).

2 Cámara de TV

- Atornille el objetivo de TV
- monte la cámara en el suplemento dual
- fije el tornillo de apriete.

3 Cámara fotográfica

- Atornille el adaptador en la cámara
- atornille el objetivo fotográfico en el adaptador de la cámara
- monte la cámara en el suplemento dual
- fije el tornillo de apriete.

4 Orientación de la cámara de TV

- Afloje el tornillo "a".
- Dependiendo del espacio disponible, enclave la cámara de TV en uno de los pasos de 45°
- fije el tornillo de apriete.

Adjusting the brightness for TV

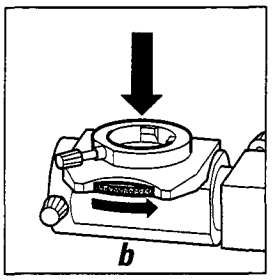
The filter changer (b) contains filters with 30%, 50% and 100% transmission, one of which can be replaced with the 8% filter provided with the outfit:

- Remove the TV camera
- Change the filter in the TV outlet.

Réglage de la luminosité pour la caméra TV

Le changeur de filtres (b) contient trois filtres de transmission: 30%, 50%, 100%, l'un deux pouvant être remplacé par le filtre 8% faisant partie de la livraison:

- Retirer la caméra
- Changer le filtre de la sortie TV



Helligkeitsregulierung für TV

Im Filterwechsler (b) befinden sich Transmissionsfilter 30%, 50%, 100%. Einer dieser Filter kann durch den 8%-Filter (mitgeliefert) ausgetauscht werden:

- Kamera abnehmen.
- Filter im TV-Ausgang auswechseln.

Regulado de la luminosidad para TV

En el cambiador de filtros "b" se hallan filtros de transmisión de 30, 50 y 100%. Uno de estos filtros puede sustituirse por el de 8% (se incluye en el suministro):

- retire la cámara
- sustituya el filtro de la salida para TV.

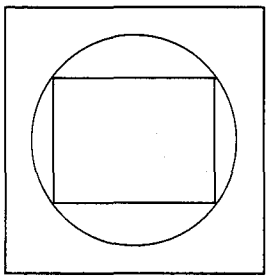
TV and photo formats with dual attachment

Formats TV et photo avec double rallonge TV et photo

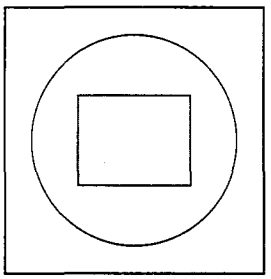
TV- und Photo-Formate mit Dualansatz

Formatos de TV y fotografía con el suplemento dual

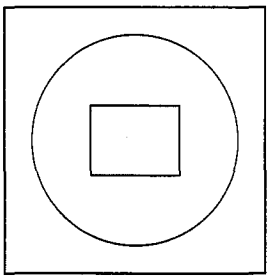
TV/Video | **Photo**



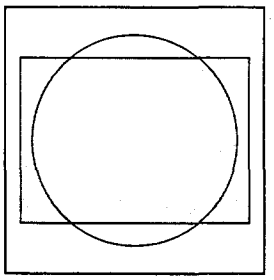
½": 60 mm



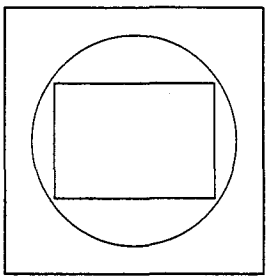
½": 85 mm



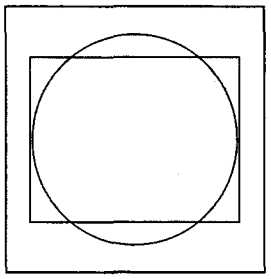
½": 107 mm



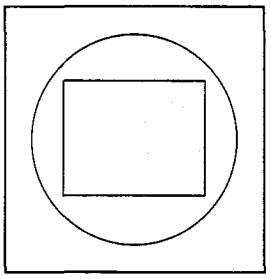
24×36 mm: 250 mm



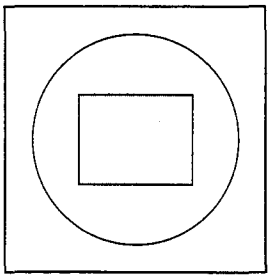
24×36 mm: 350 mm



⅔": 60 mm



⅔": 85 mm



⅔": 107 mm

Accessories

Cine/TV tube

The cine/TV tube accepts film and video cameras having a C-mount.

Fitting

1 Cine/TV tube
Secure the cine/TV tube to the beam splitter (page 35).

2 C-mount adapter
Fit the C-mount adapter to the camera.

3 Camera with adapter
- Fit the camera, complete with adapter, to the cine/TV tube
- Tighten the clamping screw.

4 Align the camera
- Release the clamping screw (a)
- Engage the camera at one of the 90° steps in accordance with the space available
- Tighten the clamping screw.

Accessoires

Rallonge ciné/TV

Cette rallonge convient à tous les modèles de caméras ciné ou vidéo munies d'un filetage C.

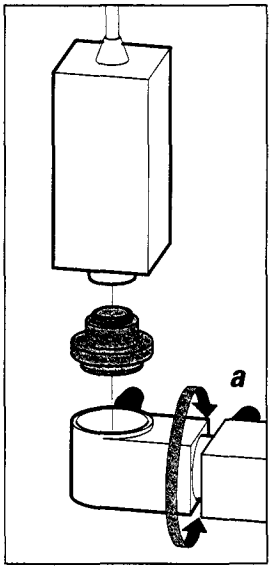
Montage

1 Fixer la rallonge ciné/TV sur le répartiteur optique (page 35).

2 Visser l'adaptateur à filetage C sur la caméra.

3 Caméra avec adaptateur
- Mettre la caméra dans la rallonge ciné/TV
- Serrer la pince à vis

4 Positionnement de la caméra
- Desserrer la pince à vis (a)
- Selon la place disponible, positionner la caméra dans l'un des crans à 90°
- Serrer la pince à vis



Zubehör

Kino-/TV-Ansatz

Der Kino-/TV-Ansatz nimmt Film- und Video-Kameras mit C-Gewinde auf.

Montage

1 Kino-/TV-Ansatz am Strahlenteiler befestigen (S. 35).

2 Adapter mit C-Gewinde an der Kamera festschrauben.

3 Kamera mit Adapter
- im Kino-/TV-Ansatz einsetzen.
- Klemmschraube festziehen.

4 Kamera ausrichten
- Klemmschraube (a) lösen.
- Kamera je nach Platzverhältnissen in einem der 90°-Schritte einrasten.
- Klemmschraube festziehen.

Accesorios

Suplemento para cine/TV

En este suplemento puede montar cámaras de TV o vídeo con rosca C.

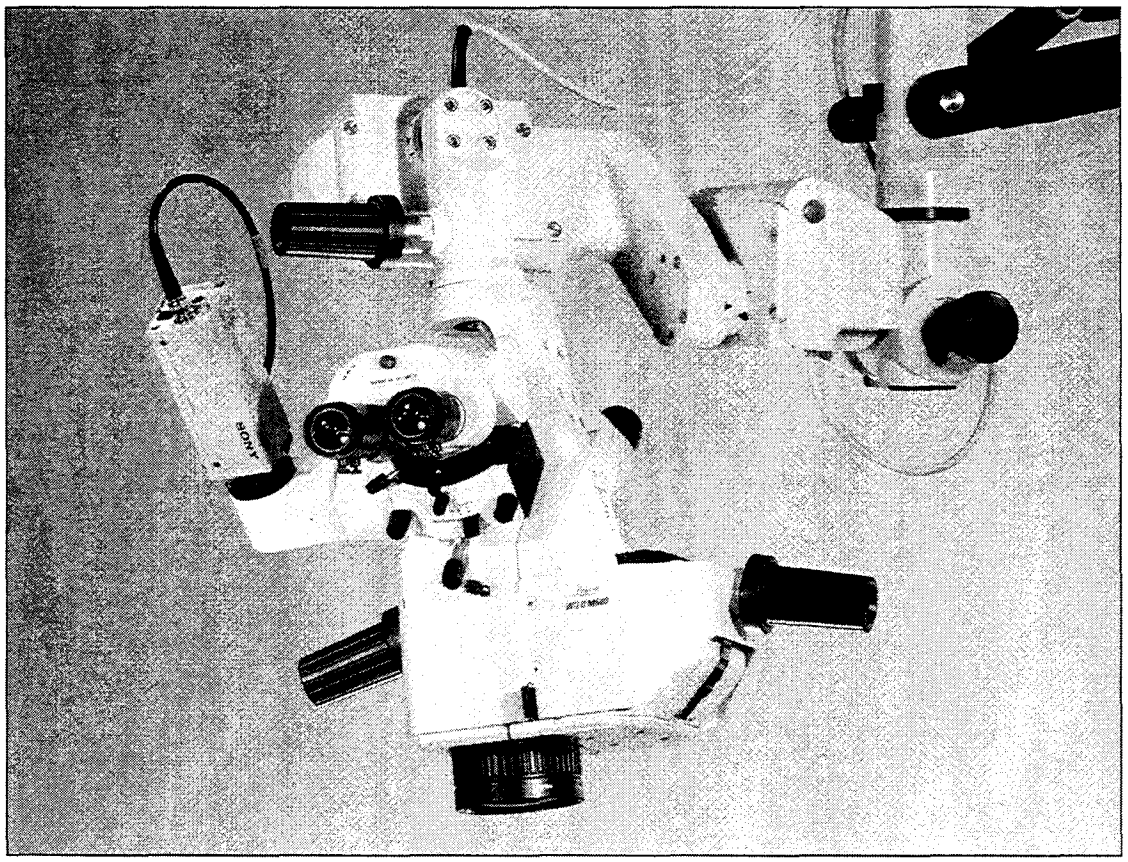
Montaje

1 Suplemento para cine/TV
- fíjelo en el divisor de rayos (pág. 35).

2 Adaptador con rosca C
- atorníllelo en la cámara.

3 Cámara con adaptador
- móntela en el suplemento para cine/TV
- fije el tornillo de apriete.

4 Orientación de la cámara
- afloje el tornillo "a"
- dependiendo del espacio disponible, enclave la cámara en uno de los pasos de 90°
- fije el tornillo de apriete.



Accessories

Phototube

Photo on page 35.

- ***f = 250 mm adapter***
  for large photographic fields and shorter exposure times. The corners are vignetted.
- ***f = 350 mm adapter***
  for higher magnifications.

Assembly

1 Secure the phototube
to the beam splitter (page 35)

2 Secure the camera adapter
to the SLR camera

3 Connect the camera adapter to the f = 250 mm or f = 350 mm adapter

4 Secure the camera, with adapter,
to the phototube
Tighten the clamping screw.

Fit the **format-indicating graticule** into the eyepiece (page 49).

Accessoires

Rallonge photo

Photo page 35.

- ***Adaptateur f = 250 mm***
  pour de grands champs de prise de vue et des temps de pose courts. Les coins restent sombres.
- ***Adaptateur f = 350 mm***
  pour de plus forts grossissements.

Montage

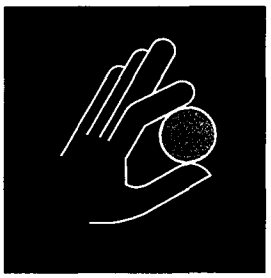
1 Rallonge photo
La fixer sur le répartiteur optique (page 35)

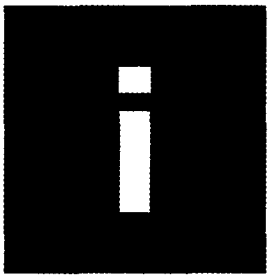
2 Adaptateur de chambre
L'installer sur l'appareil reflex

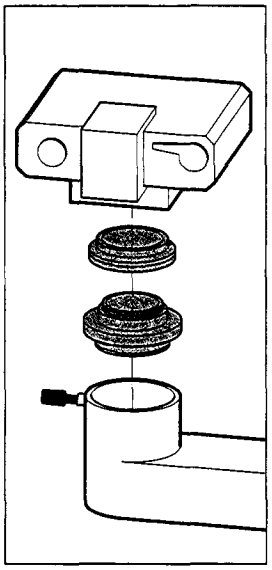
3 Adaptateur f = 250 mm ou 350 mm
Le visser sur l'adaptateur de chambre

4 Caméra avec adaptateur
La mettre dans la rallonge photo.
Serrer la pince a vis.

Introduire le **réticule de cadrage** dans l'oculaire (page 49).







Zubehör

Photoansatz

Abbildung auf S. 35.

- ***Adapter f = 250 mm***
  für grosse Aufnahmefelder und kürzere Belichtungszeiten. Die Ecken sind abgeschattet.
- ***Adapter f = 350 mm***
  für höhere Vergrösserungen.

Montage

1 Photoansatz
am Strahlenteiler befestigen (S. 35).

2 Kameraadapter
an der Spiegelreflexkamera befestigen.

3 Adapter f = 250 mm oder 350 mm
am Kameraadapter festschrauben.

4 Kamera mit Adapter
im Photoansatz einsetzen. Klemmschraube festziehen.

Formatstrichplatte in ein Okular einsetzen (S. 49).

Accesorios

Suplemento para fotografía

Fotografía, pág. 35.

- ***Adaptador f = 250 mm;***
  para campos visuales amplios y tiempos de exposición más breves. Las esquinas no están iluminadas.
- ***Adaptador f = 350 mm;***
  para aumentos más grandes.

Montaje

1 Fije el suplemento para fotografía
en el divisor de rayos (pág. 35).

2 Fije el adaptador
en la cámara réflex.

3 Acople en el adaptador de cámara el ***adaptador f = 250 ó f 350 mm***

4 Monte la cámara con adaptador
en el suplemento para fotografía y fije el tornillo de apriete.

Montaje **del retículo de formatos** en un ocular (pág. 49).

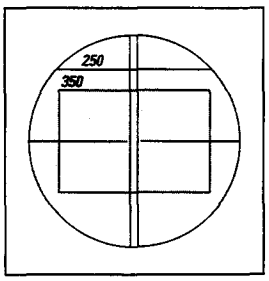
Format limits

Cadrages

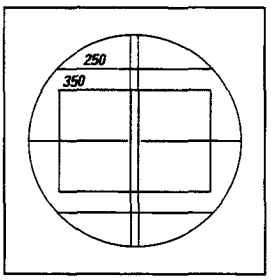
Bildausschnitte

Encuadres de la imagen

Photo

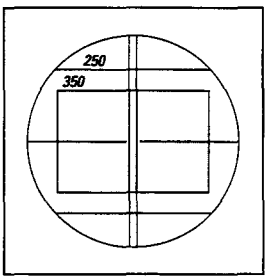


24×36 mm:
250 mm

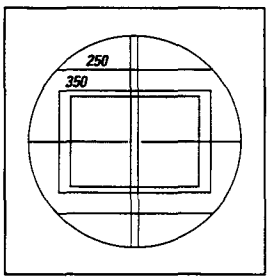


24×36 mm:
350 mm

TV/Video

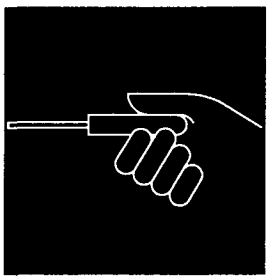


7,16×9,6:
107 mm

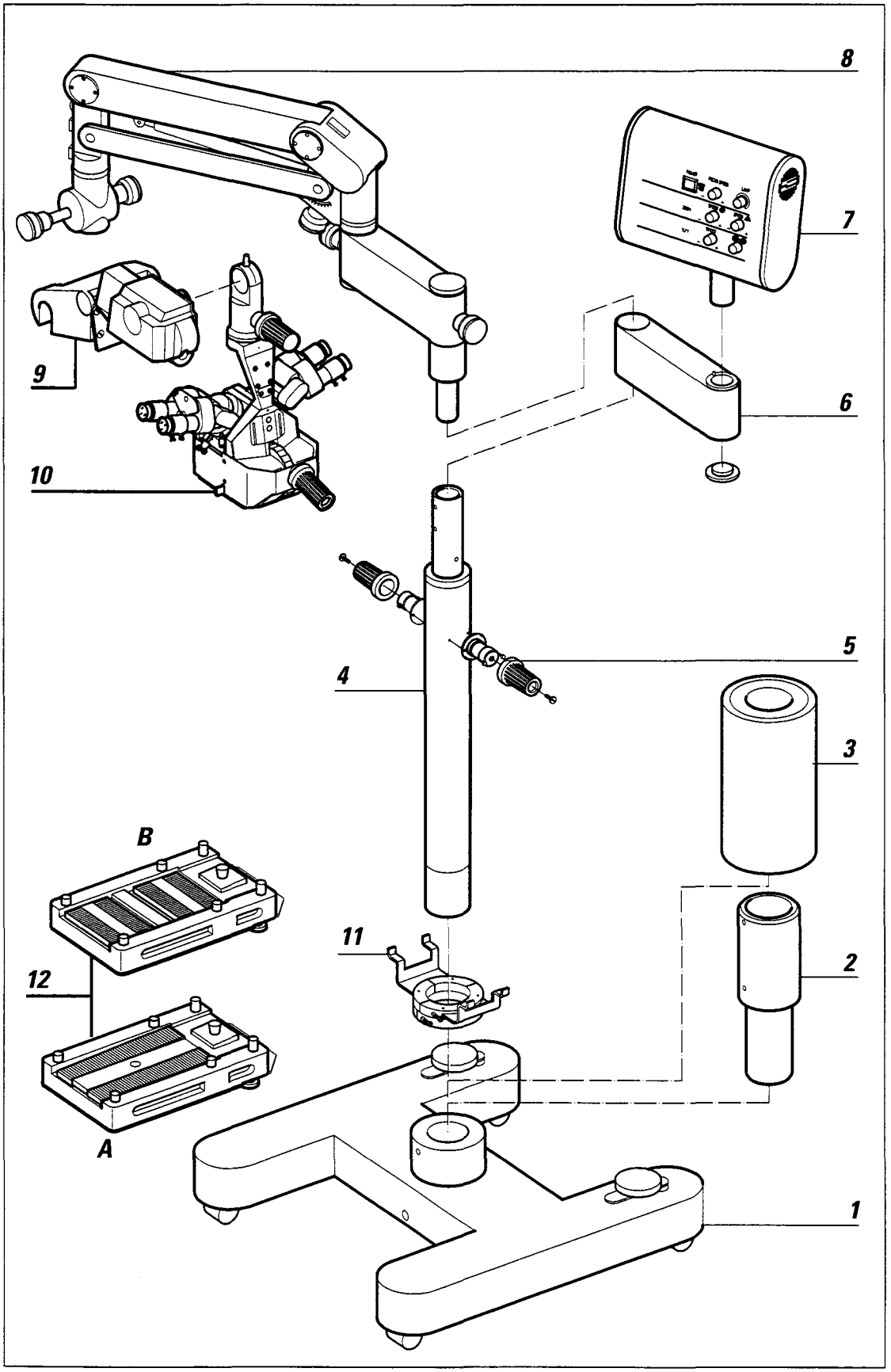


⅔":
107 mm

Assembly | Montage | Aufbau | Montaje



Floor stand | Statif de sol | Bodenstativ | Estativo de suelo



Components

1 Base
2 Column extension
3 Additional weight
4 Column
5 Handles and handle axes
6 Carrier for control unit
7 Control unit
8 Swingarm
9 Microscope carrier
10 Microscope
11 Holder for 2 foot-switches
12 Footpedal (type A or B)

Composants

1 Pied
2 Rallonge de colonne
3 Poids supplémentaire
4 Colonne
5 Porte-poignées et poignées
6 Porteur du bloc de commande
7 Bloc de commande
8 Bras mobile
9 Porte-microscope
10 Microscope
11 Support pour 2 commandes à pédale
12 Commande à pédale (type A ou B)

Einzelteile

1 Fuss
2 Säulenverlängerung
3 Zusatzgewicht
4 Säule
5 Griffhalterungen und Griffe
6 Träger für das Steuergerät
7 Steuergerät
8 Schwenkarm
9 Mikroskopträger
10 Mikroskop
11 Träger für 2 Fussschalter
12 Fussschalter (Typ A oder B)

Componentes

1 Pie
2 Prolongación de columna
3 Peso adicional
4 Columna
5 Portamangos y mangos
6 Soporte para el aparato de mando
7 Aparato de mando
8 Brazo móvil
9 Portamicroscopio
10 Microscopio
11 Soporte para dos dispositivos de control por pedal
12 Dispositivo por pedal (tipo A ó B)

Never use the floor stand without the additional weight. There is a risk of it tipping over.

1 Depress the footbrakes.
- Remove dust covers (a)
- Partly extract the screws located behind them.

2 Fit the 20cm column extension.
- Tighten the screws
- Fit the dust plugs.

3 Additional weight
Slide the additional weight over the column extension and turn it so that you can partly extract the screws (b) through the holes.

4 Column
Insert the column into the column extension.

5 Handles
- Fit handles to the two handle axes
- Turn the column in the column extension so that the handles are aligned with the cross-member of the base as shown in the diagram
- Tighten the screws (b) (through the holes) so that they engage the additional weight.

6 Slide the carrier over the column.
- Slide the black sleeve over the column
- Place the Teflon plate (c) on to the carrier and match it to the screw head.

7 Mount the **control unit** so that the screw head on the carrier engages the notch. The screw head limits the lateral movement of the control unit.
- Screw on the cover plate (d) from beneath.

Ne jamais utiliser le statif de sol sans poids supplémentaire: risque de basculement!

1 Appuyer sur les pédales de frein.
- Enlever les capuchons (a)
- Desserrer légèrement les vis.

2 Mettre la rallonge 20 cm
- Serrer les vis
- Remettre les capuchons

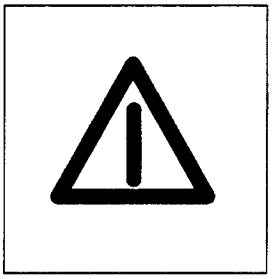
3 Poids supplémentaire
Le faire glisser sur la rallonge et le tourner de façon à pouvoir desserrer légèrement les vis (b).

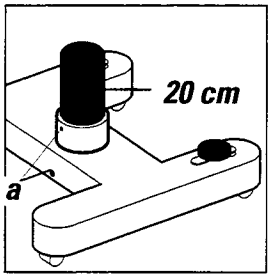
4 Colonne
La mettre dans la rallonge.

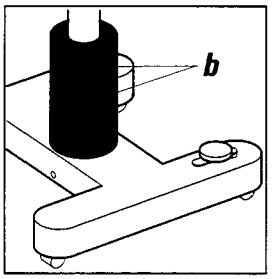
5 Poignées
- Fixer les porte-poignées
- Fixer deux poignées sur ces porte-poignées.
- Tourner la colonne pour que les poignées se trouvent dans l'alignement de la barre transversale du pied.
- Visser les vis (b) aux emplacements prévus dans le poids supplémentaire.

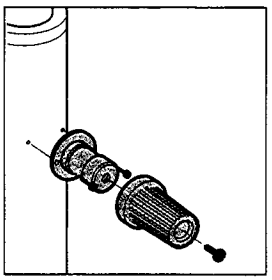
6 Mettre le **porteur** sur la colonne.
- Faire glisser le manchon noir sur la colonne.
- Placer la plaque en téflon (c) de sorte que la tête de la vis s'enclenche dans le porteur.

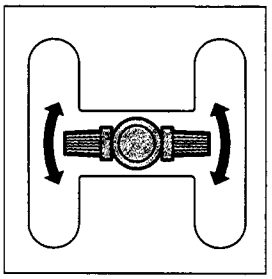
7 Placer le **bloc de commande** de sorte que la tête de la vis sur le porteur s'enclenche dans l'évidement. Son rôle est de limiter le pivotement latéral du bloc de commande.
- Visser le couvercle (d) par en bas.

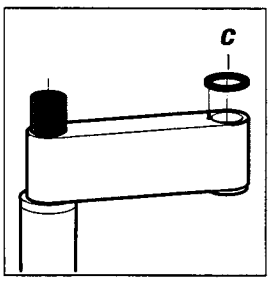


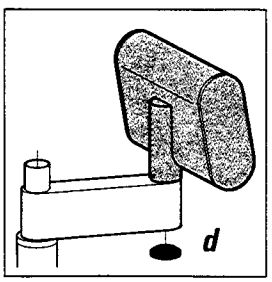












Bodenstativ nie ohne Zusatzgewicht benutzen = Kippgefahr!

1 Fussbremsen festtreten.
- Staubdeckel (a) entfernen.
- Die Schrauben, die sich dahinter befinden, teilweise herausdrehen.

2 20 cm-Verlängerung einsetzen.
- Schrauben festziehen.
- Staubdeckel einsetzen.

3 Zusatzgewicht
über die Verlängerung schieben und so verdrehen, bis Sie die Schrauben 'b' durch die Löcher hindurch teilweise herausdrehen können.

4 Säule
in der Säulenverlängerung einsetzen.

5 Griffe
- Griffhalterungen befestigen.
- Zwei Griffe an den Griffhalterungen befestigen.
- Säule in der Säulenverlängerung verdrehen, bis die Griffe wie im Bild zum Querbalken des Fusses ausgerichtet sind.
- Schrauben (b) durch die Löcher im Zusatzgewicht hindurch festziehen.

6 Träger
über die Säule schieben.
- Schwarze Hülse über die Säule schieben.
- Teflonplatte (c) so auflegen, dass der Schraubenkopf am Träger einrastet.

7 Steuergerät
so einsetzen, dass der Schraubenkopf am Träger in der Aussparung einrastet. Der Schraubenkopf begrenzt die seitliche Drehbewegung des Steuergerätes.
- Deckel (d) von unten festschrauben.

No emplee nunca el estativo de suelo sin contrapeso = peligro de vuelco

1 Pise los pedales de freno.
- Retire las tapas protectoras "a".
- Saque parcialmente los tornillos que se encuentran detrás.

2 Coloque la prolongación de columna de 20 cm.
- Apriete los tornillos.
- Coloque las tapas protectoras.

3 Desplace el **peso adicional** sobre la prolongación y gírelo de tal forma que pueda sacar parcialmente los tornillos "b" a través de los orificios.

4 Inserte la **columna** en la prolongación.

5 Mangos
- Fije los portamangos.
- Fije los dos mangos en los correspondientes portamangos.
- Gire la columna en la prolongación hasta que los mangos estén alineados con el travesaño del pie del estativo (véase dibujo).
- Introduzca los tornillos "b" en los orificios del peso adicional y apriételos.

6 Guíe el **soporte** a lo largo de la columna.
- Deslice la cubierta negra en la columna.
- Coloque la placa de teflon "c" de tal manera que la cabeza del tornillo engrane en el soporte.

7 Coloque el **aparato de mando** de tal manera que la cabeza del tornillo del soporte engrane en la entalladura. La cabeza del tornillo limita el movimiento lateral del aparato de mando.
- Atornille la tapa "d" desde abajo.

Assembly

Swingarm, Surgical microscope

Fitting the swingarm on the column

Make sure that the swingarm is locked and folded up and that the articulation brakes are tight.

- Fit the swingarm
- Turn the control unit and sleeve together so that the four screws can be tightened through the holes.

Fitting microscope carrier to swingarm

- ***Make sure that the swingarm is locked***
- ***Tighten the articulation brakes.***

- Open the orange clamping knob completely
- Suspend the **microscope carrier,** using the crane hook, position it horizontally, and engage it in the perforated plate
- Tighten the orange clamping knob.

Fitting microscope to microscope carrier

During fitting, ensure that the lamp housing faces towards the column of the stand, with index 1 in front.

Use the four hollow screws to secure the microscope to the microscope carrier.

Montage

Bras mobile, Microscope d'opération

Montage du bras mobile sur la colonne du statif

Le bras mobile doit être bloqué et plié et les boutons de freinage serrés.

- Placer le bras mobile sur la colonne
- Tourner le bloc de commande et le manchon de façon à pouvoir serrer les 4 vis.

Montage du porte-microscope sur le bras mobile

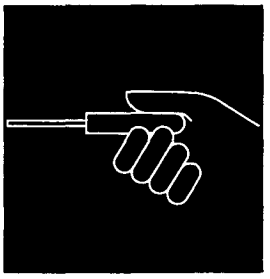
- ***Vérifier si le bras mobile est bloqué***
- ***Serrer les boutons de freinage***

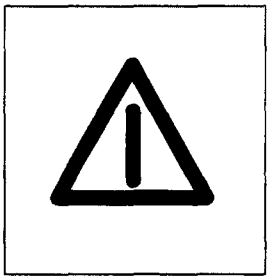
- Dévisser le bouton orange jusqu'à la butée
- Fixer le **porte-microscope** à l'aide du crochet de sécurité puis l'encliqueter dans le disque perforé en le tenant à l'horizontale.
- Visser le bouton orange.

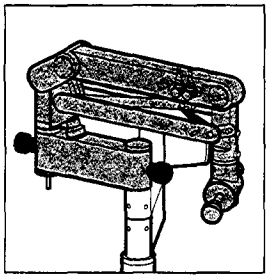
Montage du microscope sur le porte-microscope:

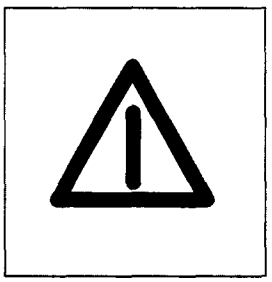
Veiller à ce que le boîtier de lampe soit dirigé vers la colonne du statif. L'index 1 doit se trouver à l'avant.

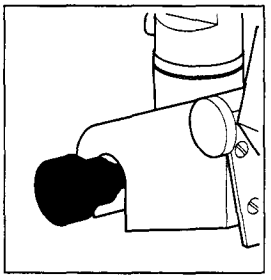
Fixer le microscope au porte-microscope à l'aide des 4 vis à six pans.

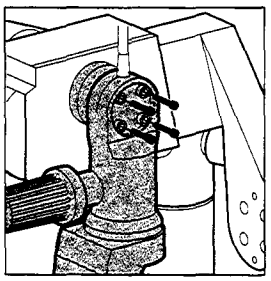












Aufbau

Schwenkarm, Operations-mikroskop

Montage Schwenkarm – Stativsäule

Kontrollieren, ob der Schwenkarm blockiert und zusammengefaltet ist und die Gelenkbremsen festgezogen sind.

- Schwenkarm einsetzen.
- Steuergerät und Hülse so verdrehen, dass Sie die 4 Schrauben durch die Löcher hindurch festziehen können.

Montage Mikroskopträger – Schwenkarm

- ***Kontrollieren, ob der Schwenkarm blockiert ist.***
- ***Gelenkbremsen festziehen.***

- Orangen Klemmknopf bis Anschlag aufdrehen.
- **Mikroskopträger** mittels Kranhaken anhängen und horizontal gerichtet in der Lochscheibe einrasten.
- Orangen Klemmknopf festziehen.

Montage Mikroskop – Mikroskopträger

Beachten Sie beim Montieren, dass das Lampenhaus zur Stativsäule weist. Index 1 vorn.

Befestigen Sie das Mikroskop mit 4 Inbusschrauben am Mikroskopträger.

Montaje

Brazo móvil, Microscopio de operación

Montaje brazo móvil – columna del estativo

Controle si el brazo móvil está bloqueado y plegado y si los frenos de articulación están echados.

- Coloque el brazo móvil.
- Gire el aparato de mando y la cubierta de tal forma que pueda apretar los 4 tornillos "e" a través de los orificios.

Montaje portamicroscopio-brazo móvil

- ***Controle si el brazo móvil está bloqueado.***
- ***Apriete los frenos de articulación.***

- Afloje el botón de apriete anaranjado, girándolo hasta el tope.
- Enganche el **porta-microscopio** con el gancho de grúa y, en posición horizontal, encájelo en el disco perforado.
- Apriete el botón anaranjado.

Montaje microscopio – portamicroscopio

Durante el montaje, cerciórese de que la caja de lámpara señala hacia la columna del estativo. Indice 1 delante.

Acople el microscopio en el portamicroscopio mediante 4 tornillos de cabeza hexagonal.

Assembly

Footswitch and handswitch

Apply blue and red symbols to the footswitch or handswitch. Mark the plugs with blue and red adhesive strips (all supplied).

Connect the footswitch or handswitch (page 46).
Respect the correct arrangement:
- Footswitch or handswitch ● (red) for surgeon ● (red)
- Footswitch or handswitch ▲ (blue) for surgeon ▲ (blue).

Holder for footswitches
Make sure that the gaps between the two halves of the clamping ring are the same width as those between the two halves of the rotatable ring.

- Connect the two halves of the clamping ring (4 adjustment screws facing upwards) with two screws
- Place the two halves of the rotatable ring on the clamping ring
- Push the disks into the spaces and tighten the two screws.

Cleaning the footswitch
Zoom/focus pedals
Release the 4 screws on the base of the footswitch so that the pedals can be removed and cleaned.

XY control plate
Unscrew the joystick.
The securing screw can be loosened through the hole (a) in the control plate.

Montage

Commande à pédale/manuelle

Coller les symboles bleu et rouge sur la commande à pédale ou manuelle.

Marquer les prises avec des bandes adhésives bleue et rouge (font partie de la livraison).

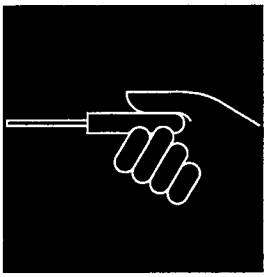
Raccorder la commande à pédale ou manuelle (page 46):
en respectant la disposition correcte:
- Commande à pédale ou manuelle ● (rouge) pour le chirurgien ● (rouge)
- Commande à pédale ou manuelle ▲ (bleue) pour le chirurgien ▲ (bleue)

Support de la commande à pédale
Lors du montage, les fentes formées par les deux moitiés de l'anneau de serrage doivent être identiques à celles de la bague tournante.

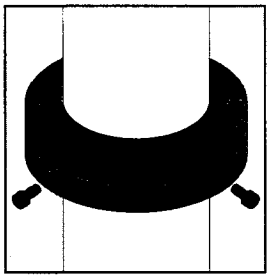
- Relier les deux moitiés de l'anneau de serrage, les 4 vis à tenon carré vers le haut, à l'aide de deux vis.
- Mettre les deux moitiés de la bague tournante sur l'anneau de serrage.
- Insérer les rondelles dans les fentes et serrer les deux vis.

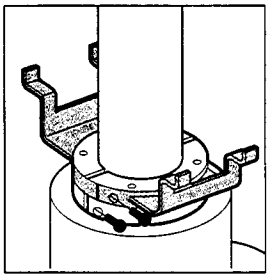
Nettoyage de la commande à pédale
Pédales du zoom/de la mise au point
Dévisser les 4 vis de la plaque de fond puis retirer les pédales.

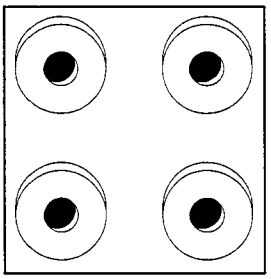
Plaque de commande XY
Dévisser le joystick.
Libérer la vis de fixation par l'ouverture (a) de la plaque de commande.

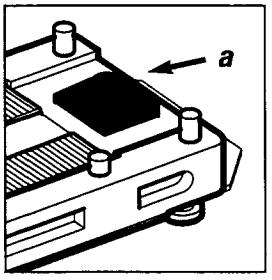


▲ ●









Aufbau

Fuss-/Handschalter

Blaue und rote Symbole auf die Fuss- oder Handschalter kleben.

Stecker mit blauen und roten Klebstreifen markieren (alles mitgeliefert).

Fuss- oder Handschalter anschliessen (S. 46). Richtige Zuordnung beachten:
- Fuss- oder Handschalter ● (rot) für Chirurg ● (rot)
- Fuss- oder Handschalter ▲ (blau) für Chirurg ▲ (blau)

Träger für Fussschalter
Achten Sie beim Montieren darauf, dass die Spalten zwischen den Klemmring- und Drehringhälften gleich sind.

- Klemmringhälften, 4 Justierschrauben nach oben, mit zwei Schrauben verbinden.
- Drehringhälften am Klemmring anlegen.
- Unterlagsscheiben in die Spalten schieben und zwei Schrauben festziehen.

Fussschalter reinigen
Zoom-/Fokus-Pedale
4 Schrauben am Boden lösen. Dann können die Pedale abgenommen und gereinigt werden.

XY-Steuerplatte
Joystick abschrauben.
Durch das Loch (a) in der Steuerplatte kann die Befestigungsschraube gelöst werden.

Montaje

Dispositivo de control por pedal/manual

Pegue los símbolos rojos y azules en los dispositivos de control por pedal o manual. Señalice los enchufes con cinta adhesiva azul y roja (estos elementos forman parte del suministro).

Conecte el dispositivo de control por pedal o manual (pág. 46).
Observe si la disposición es correcta:
- Dispositivo de control por pedal o manual ● (rojo) para cirujano ● (rojo)
- Dispositivo de control por pedal o manual ▲ (azul) para cirujano ▲ (azul)

Soporte para el dispositivo de mando por pedal
Preste atención para que las hendiduras entre las dos mitades del anillo de apriete sean idénticas a las del giratorio.

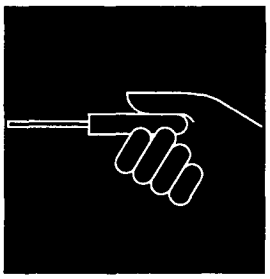
- Conecte las dos mitades del anillo de apriete (los 4 tornillos de ajuste mirando hacia arriba) con 2 tornillos.
- Coloque las dos mitades del anillo giratorio sobre el anillo de apriete.
- Lleve las arandelas a las hendiduras y apriete dos tornillos.

Limpiado del dispositivo de control por pedal
Pedales para zoom/enfoque
Afloje 4 tornillos de la base para retirar los pedales.

Placa de control XY
Desatornille el joystick.
A través del orificio (a) de la placa de control se puede aflojar el tornillo de fijación.

Assembly

Montage



Aufbau

Montaje

Control unit

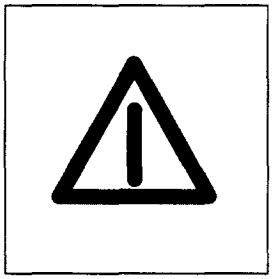
Always pull out the power cable before opening the control unit for servicing.

For additional information, see p. 58

Bloc de commande

Ne jamais oublier de retirer le câble réseau de la prise de courant avant d'ouvrir le bloc de commande!

Pour d'autres remarques et données, voir p. 58.



Steuergerät

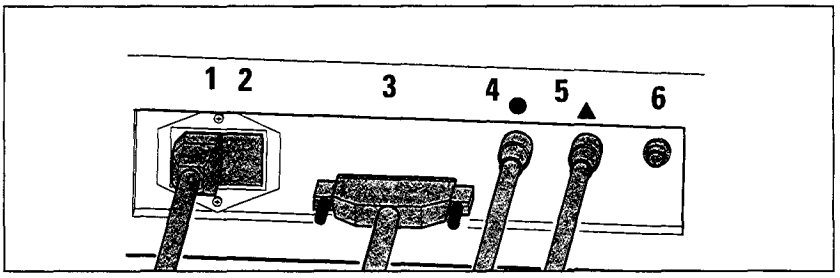
Wenn das Steuergerät zu Servicezwecken geöffnet werden muss, erst das Netzkabel aus der Steckdose ziehen!

Weitere Hinweise und Daten siehe S. 58.

Aparato de mando

Cuando deba abrir el aparato de control, recuerde de desenchufar primero el cable de red.

Para más observaciones datos, consulte pág. 58.



Connections

1 Power cable
2 Fuse holder (2×1.6AT, 5×20mm, stock no. 393 606) and voltage selector
3 Cable from swingarm, secured with two grub-screws
4 Footswitch or hand-switch, red ●
5 Footswitch or handswitch, blue ▲
6 Additional instrument.

Connexions électriques

1 Câble réseau
2 Porte-fusibles (2×1,6 AT, 5×20 mm, n° d'art. 393 606) et sélecteur de tension
3 Fixer le câble du bras mobile à l'aide de deux vis sans tête
4 Commande à pédale ou manuelle, rouge ●
5 Commande à pédale ou manuelle, bleue ▲
6 Appareil supplémentaire

Anschlüsse

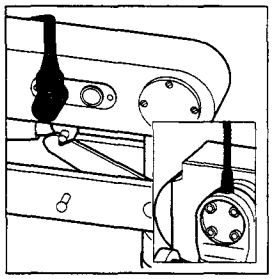
1 Netzkabel
2 Sicherungshalter (2×1,6AT, 5×20 mm, Best. Nr. 393 606) und Spannungswähler
3 Kabel vom Schwenk-arm, mit zwei Gewinde-stiften fixiert.
4 Fuss- oder Handschalter rot ●
5 Fuss- oder Handschalter blau ▲
6 Zusatzgerät

Conexiones

1 Cable de red
2 Portafusibles (2×1,6 AT, 5×20 mm, núm. de pedido 393 606) y selector de tensión
3 Cable del brazo móvil, fijado con 2 pernos de rosca
4 Dispositivo de control por pedal o manual, rojo ●
5 Dispositivo de control por pedal o manual, azul ▲
6 Instrumento adicional

Connect the cable from the surgical microscope
to the green socket on the swingarm and secure it. Hang the cable on to the cable clips in slack loops.

Raccorder le câble du microscope d'opération
à la douille verte du bras mobile, le visser et le placer en large boucles dans le porte-câble.

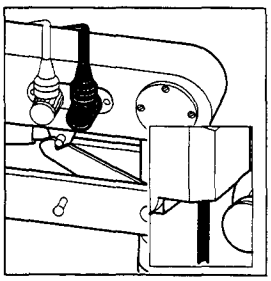


Kabel vom Operationsmikroskop
an der grünen Buchse am Schwenkarm anschliessen, festschrauben und in lockeren Schlaufen in die Kabelhalter einlegen.

Inserte el cable del microscopio de operación
en el enchufe verde del brazo móvil, atorníllelo y enróllelo en el portacables, dejándolo suficientemente holgado.

Connect the cable from the microscope carrier
to the grey socket on the swingarm and secure it.

Raccorder le câble du porte-microscope
à la douille grise du bras mobile, le visser.

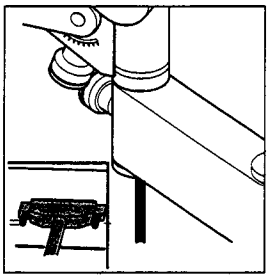


Kabel vom Mikroskopträger
an der grauen Buchse am Schwenkarm anschliessen und festschrauben.

Enchufe el cable del portamicroscopio
en el enchufe gris del brazo móvil y atorníllelo.

Connect the cable from the swingarm
to the control unit.

Raccorder le câble du bras mobile
au bloc de commande.

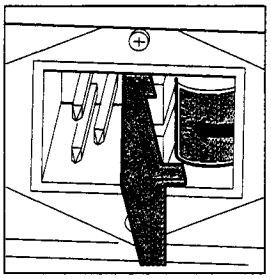


Kabel vom Schwenkarm
am Steuergerät anschliessen.

Enchufe el cable del brazo móvil
en el aparato del mando.

Set the power supply voltage
- Open the cover
- Turn the drum so that the appropriate figure 115V (for 100-120V) or 230V (for 200-240V) is visible in the window when the cover is replaced.

Réglage de la tension du réseau:
- Ouvrir la plaque
- Tourner le tambour jusqu'à ce que la tension voulue 115 V (pour tensions 100-120 V) ou 230 V (pour tensions 200-240 V) apparaisse dans la fenêtre de la plaque refermée.

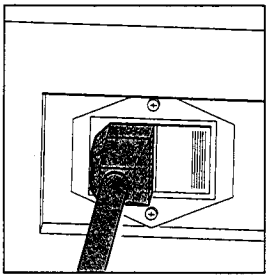


Netzspannung einstellen:
- Klappe öffnen.
- Trommel so drehen, dass die entsprechende Zahl 115 V (für Spannungen 100–120 V) oder 230 V (für Spannungen 200–240 V) im Fenster der geschlossenen Klappe erscheint.

Ajuste de la tensión de la red:
- abra la tapa
- gire el tambor de tal manera que, una vez cerrada la tapa, aparezca 115 V (para tensiones de 100 a 120 V) ó 230 V (para tensiones de 200 a 240 V) en la ventanita.

Connect the power cable

Raccorder le câble réseau.



Netzkabel anschliessen.

Conecte el cable de red.

Check that all cables are properly attached.

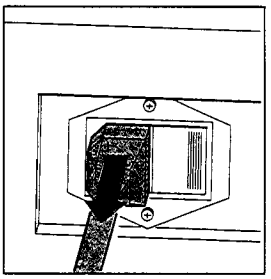
Contrôler tous les câbles.

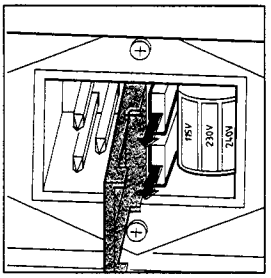
Alle Kabel auf festen Sitz kontrollieren.

Controle si todos los cables están bien enchufados.

Changing fuses
If, after the control unit has been properly connected and switched on, neither the illuminator nor any of the diodes shines, first inspect the fuses.
- Pull out the power cable
- Open the cover
- Pull out the holders marked with an arrow. You can tell a blown fuse by its melted glass tube
- Replace the holders complete with new fuses.

Changement de fusibles
Le bloc de commande est raccordé correctement et sous tension: ni l'éclairage, ni les diodes ne s'allument. Dans ce cas, contrôler d'abord les fusibles.
- Retirer le câble réseau de la prise de courant
- Ouvrir la plaque
- Retirer les fixations marquées d'une flèche. Un fusible est défectueux lorsque le fil dans le tube de verre a fondu
- Remettre les fixations pourvues des nouveaux fusibles



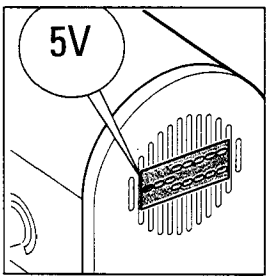


Sicherungswechsel
Falls beim korrekt angeschlossenen und eingeschalteten Steuergerät weder die Beleuchtung noch eine Diode leuchtet, prüfen Sie zuerst die Sicherungen.
- Netzkabel abziehen.
- Klappe öffnen.
- Die mit Pfeil markierten Halterungen herausziehen. Sie erkennen eine defekte Sicherung daran, dass der Faden in der Glasröhre geschmolzen ist.
- Halterungen mit neuen Sicherungen einsetzen.

Cambio de fusibles
Si el aparato de mando está correctamente conectado y ha dado al interruptor de conexión, y no se enciende la iluminación ni ningún diodo, controle primero los fusibles.
- Desenchufe el cable de red.
- Abra la tapa.
- Saque los portafusibles marcados con una flecha. Un fusible averiado se reconce en que el filamento del tubito de vidrio está fundido.
- Coloque los portafusibles provistos de nuevos fusibles.

Locating faults
You can speed up the fault-finding process if you inspect the diodes on the control unit and then let the Leica agency have answers to the following questions:
- Does the 5V diode shine?
- If neither the illuminator nor any of the diodes shines, first inspect the fuses (see above).
- Which diodes shine when you activate the footswitch or handswitch?

Localisation de pannes
En cas de pannes, contrôler d'abord les diodes du bloc de commande avant d'informer la représentation Leica:
- La diode 5 V est-elle allumée?
- Si ni l'éclairage ni la diode ne s'allument, contrôler les fusibles (voir ci-dessus)
- Quelles sont les diodes qui s'allument lorsque vous actionnez la commande à pédale ou manuelle?



Fehlerlokalisierung
Bei Funktionsstörung beschleunigen Sie die Fehlerbehebung, wenn Sie die Dioden am Steuergerät kontrollieren, bevor Sie die Leica Vertretung informieren:
- Leuchtet die Diode 5 V?
- Falls weder die Beleuchtung noch eine Diode leuchtet, prüfen Sie zuerst die Sicherungen (siehe oben).
- Welche Dioden leuchten, wenn Sie den Fuss- bzw. Handschalter betätigen?

Localización de errores
Puede acelerar el proceso de localización de errores si inspecciona los diodos situados en el aparato de control antes de ponerse en contacto con la representanción de Leica.
- ¿Luce el diodo 5 V?
- Si no funciona la iluminación ni tampoco se iluminan los diodos, controle primeramente los fusibles (véase arriba).
- ¿Qué diodos lucen, si acciona el dispositivo de mando por pedal o manual?

Assembly

Stereo modules, binocular tube, objective, eyepieces

Stereo modules

- Introduce the short or long stereo module obliquely into the mount and lower it
- Tighten the clamping screws.

If you use a beam splitter

Fit the beam splitter on top of the stereo module and afterwards fit the tube adapter (page 34).

Tube adapters

- Fit the tube adapter into the dovetail ring on the stereo module or on the beam splitter
- Move the tube adapter slightly from side to side until the locating screws on the stereo module or beam splitter engage the guides on the tube adapters
- Tighten the clamping screws.

Binocular tube

Secure the binocular tube in the same manner on top of the tube adapter.

Montage

Modules stéréo Tube binoculaire Objectif Oculaires

Modules stéréo

- Au choix court ou long. L'introduire obliquement dans les tourillons et l'abaisser.
- Visser les pinces à vis.

Avec répartiteur optique:

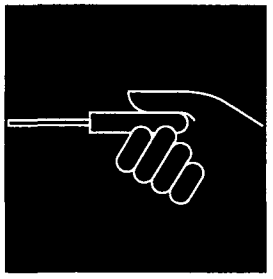
Fixer le répartiteur optique sur les modules stéréo, puis la bague intermédiaire tournante (page 34).

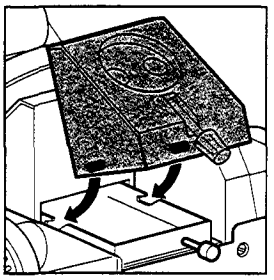
Bague intermédiaire tournante

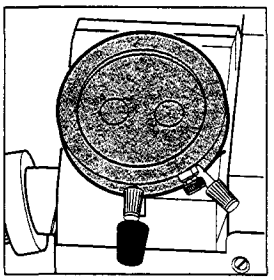
- Placer la bague dans la queue d'aronde des modules stéréo, respectivement du répartiteur optique
- La tourner légèrement de gauche à droite jusqu'à ce que les vis d'orientation du module stéréo/répartiteur optique s'enclenchent dans la glissière de la bague.
- Serrer les pinces à vis.

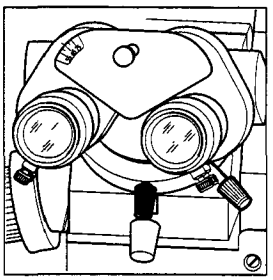
Tubes binoculaires

Procéder de la même façon qu'avec la bague intermédiaire.









Aufbau

Stereo-Module, Binokulartubus, Objektiv, Okulare

Stereo-Module

- nach Wahl kurz oder lang, leicht schräg in die Zapfen einführen und absenken.
- Klemmschrauben festziehen.

Bei Verwendung eines Strahlenteilers:

Strahlenteiler auf den Stereo-Modulen befestigen und dann erst das Tubuszwischenstück befestigen (S. 34).

Tubuszwischenstücke

- in die Ringschwalben auf den Stereo-Modulen bzw. auf dem Strahlenteiler einführen und
- nach beiden Seiten leicht verdrehen, bis die Orientierungsschrauben an den Stereo-Modulen/Strahlenteiler in die Führungen an den Tubuszwischenstücken greifen.
- Klemmschrauben festziehen.

Binokulartuben

auf dieselbe Weise auf den Tubuszwischenstücken befestigen.

Montaje

Módulos estereoscópicos Tubo binocular Objetivos Oculares

Módulos estereoscópicos

- Encaje el módulo estereoscópico largo/corto de forma oblicua en las espigas y bájelo.
- Apriete los tornillos.

Si emplea un divisor de rayos:

- Fije primeramente el divisor de rayos en los módulos estereoscópicos y luego la pieza intermedia giratoria (pág. 34).

Pieza intermedia giratoria

- Introduzca la pieza intermedia en la cola de milano de los módulos estereoscópicos/del divisor de rayos
- y gírela ligeramente hacia ambos lados, hasta que los tornillos guía de los módulos estereoscópicos/del divisor de rayos encajen en la guía de las piezas intermedias.
- Apriete los tornillos.

Tubos binoculares

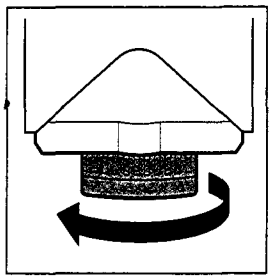
Acóplelos de la misma manera en las piezas intermedias giratorias.

Objective

Attach the objective, screwing it carefully on to the microscope anticlockwise.

Objectif

Le visser avec précaution sur le microscope, dans le sens inverse des aiguilles d'une montre.



Objektiv

gegen den Uhrzeigersinn am Mikroskop vorsichtig festschrauben.

Objetivo

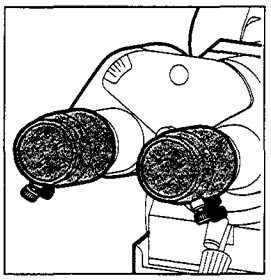
Enrósquelo en el microscopio en dirección contraria a las agujas del reloj.

Eyepieces

- If necessary, fit spacing rings (page 18) and/or the graticule for focusing and framing
- Push each eyepiece fully into the tube and then tighten the clamping screws (a). Inspect the seating of the eyepieces.

Oculaires

- Le cas échéant, insérer des anneaux d'écartement (page 18) et/ou un réticule de cadrage.
- Introduire les oculaires dans les tubes jusqu'à la butée. Serrer les vis (a), puis contrôler s'ils sont bien en place.



Okulare

- Evtl. Distanzringe (S. 18) und/oder Formatstrichplatte einsetzen.
- Okulare bis zum Anschlag in die Tubusrohre schieben. Die Klemmschrauben 'a' festziehen. Festen Sitz kontrollieren.

Oculares

- Si se requiere, coloque anillos espaciadores (pág. 18) y/o un retículo de formatos.
- Introduzca los oculares en el tubo hasta el tope. Apriete los tornillos "a" y controle si los oculares están bien encajados.

Graticule

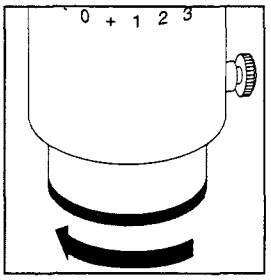
The graticule in one of the eyepieces is for determining the format limits on the film when the phototube is used (see page 41).

Adjust the diopter setting **with the graticule** in position (page 26).

Réticule

Le réticule, placé dans l'un des oculaires du tube d'observation, sert au cadrage de l'image en cas d'utilisation de la rallonge photo (voir page 41).

Réglage des dioptries **avec réticule,** voir page 26.



Strichplatte

Die Formatstrichplatte in einem Okular dient zur Bestimmung der Bildausschnitte auf dem Film mit dem Photoansatz (siehe S. 41).

Dioptrien **mit Strichplatte** einstellen (S. 26).

Retículo

El retículo de formatos colocado en uno de los oculares permite determinar los encuadres de la imagen cuando se emplea el suplemento para fotografía (véase pág. 41).

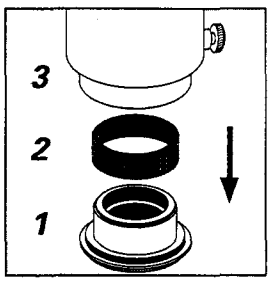
Ajuste de dioptrías **con retículo** (pág. 26)

Fitting the graticule

1 Unscrew the insert from the underside of the eyepiece
2 Press the mount of the graticule fully home on to the sleeve of the insert
3 Replace the insert in the eyepiece.

Mise en place du réticule

1 Dévisser la monture à l'aide de l'anneau moleté sous l'oculaire
2 Introduire le réticule dans la monture en exerçant une pression. Contrôler le bon positionnement.
3 Visser la monture.



Strichplatte einsetzen

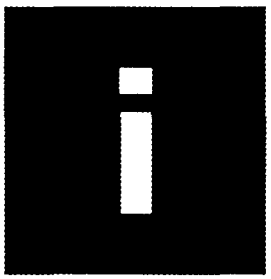
1 Einsatz mit Rändelring unten am Okular abschrauben.
2 Strichplatte mit etwas Druck auf den Einsatz schieben. Festen Sitz prüfen!
3 Einsatz festschrauben.

Colocación del retículo

1 Desenrosque el manguito inferior del ocular.
2 Coloque el retículo, presionando ligeramente. Compruebe si ha asentado bien.
3 Vuelva a enroscar el manguito.

Bulbs

Ampoules



Glühlampen

Bombillas

Changing the bulb

When changing the bulb, use only precision-centred M680 12V/50W halogen bulbs in special mount.

Changement d'ampoule

N'utiliser que les ampoules halogènes centrées M680 de 12 V/ 50 W dans une monture spéciale.

Lampenwechsel

Setzen Sie nur die präzisions-zentrierten M680-Halogen-Glühlampen 12 V/50 W in Spezialfassung ein.

Cambio de bombillas

Monte únicamente bombillas de halógeno centradas de 12V/15W del M680 con casquillo especial.

Do not touch the glass of the new bulb.

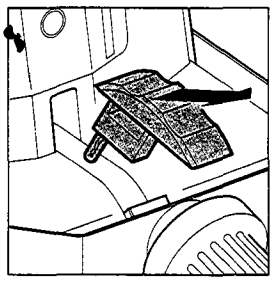
Fingermarks which may cause it to burst when hot, can be removed with a cloth dampened with alcohol.

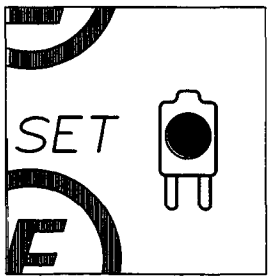
- Turn the wheel until you can extract the defective bulb
- Holding the wheel, insert the new bulb
- Turn the wheel until the bulb clicks into position.
  The warning lamp must now go out.

Ne pas toucher le verre des nouvelles ampoules

qui risquerait d'éclater sous l'effet de la chaleur. En cas de contact, nettoyer le verre avec de l'alcool.

- Tourner le disque jusqu'à pouvoir retirer l'ampoule défectueuse tout en le maintenant.
- Placer la nouvelle ampoule.
- Tourner le disque jusqu'à ce que l'ampoule s'enclenche. La lampe témoin doit maintenant s'éteindre.





Glas beim Einsetzen der neuen Glühlampe nicht berühren.

Sie könnte sonst beim Erhitzen zerspringen. Bei Berührung Glas mit Alkohol putzen.

- Wechselrad drehen, bis Sie die defekte Glühlampe an der gerändelten Fassung herausziehen können. Dabei Wechselrad festhalten.
- Neue Glühlampe einsetzen.
- Wechselrad drehen, bis die Glühlampe einrastet.
  DieWarnlampe muss nun verlöschen.

No toque el cristal cuando monte la nueva bombilla, podría saltar al calentarse.

En caso de contacto, limpie las huellas dactilares con alcohol.

- Gire el disco hasta que llegue a la bombilla defectuosa. Sáquela mientras sujeta el disco.
- Introduzca la nueva bombilla.
- Gire el disco hasta que encaje la bombilla. La lámpara de aviso deberá dejar de lucir.

Assembly

Ceiling mount

Fitting

The fitting of the ceiling mount, and the electrical connections , will be organized by the **Leica agency.**

The fitting of the microscope carrier is described on page 44.

The **control unit** can be fitted either to the stand or to the wall.

Functions

1 Main switch with pilot lamp.
2 Handswitch: Motorized lifting and lowering of the jib
3 Connection for handswitch.

Montage

Statif de plafond

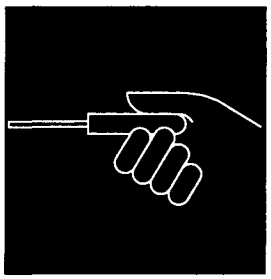
C'est la **représentation Leica** qui s'occupe du montage du statif de plafond et des connexions électriques.

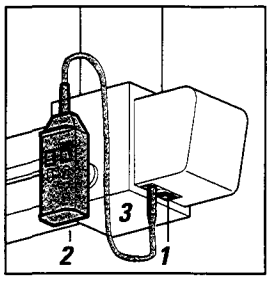
Pour la fixation du porte-microscope, voir page 44.

Le **bloc de commande** se fixe sur le statif ou sur le mur.

Fonctions

1 Interrupteur principal avec lampe témoin.
2 Commande manuelle pour relèvement/ abaissement à moteur du bras du statif.
3 Connexion de la commande manuelle.





Aufbau

Deckenstativ

Montage

Die Montage des Deckenstativs und der elektrischen Verbindungen zum Deckenstativ wird von der **Leica Vertretung** geregelt.

Befestigung des Mikroskopträgers siehe S. 44

Das **Steuergerät** kann am Stativ oder an der Wand befestigt werden.

Funktionen

1 Hauptschalter mit Kontrollampe
2 Handschalter: Stativarm motorisch heben/senken.
3 Anschluss Handschalter

Montaje

Estativo de techo

Montaje

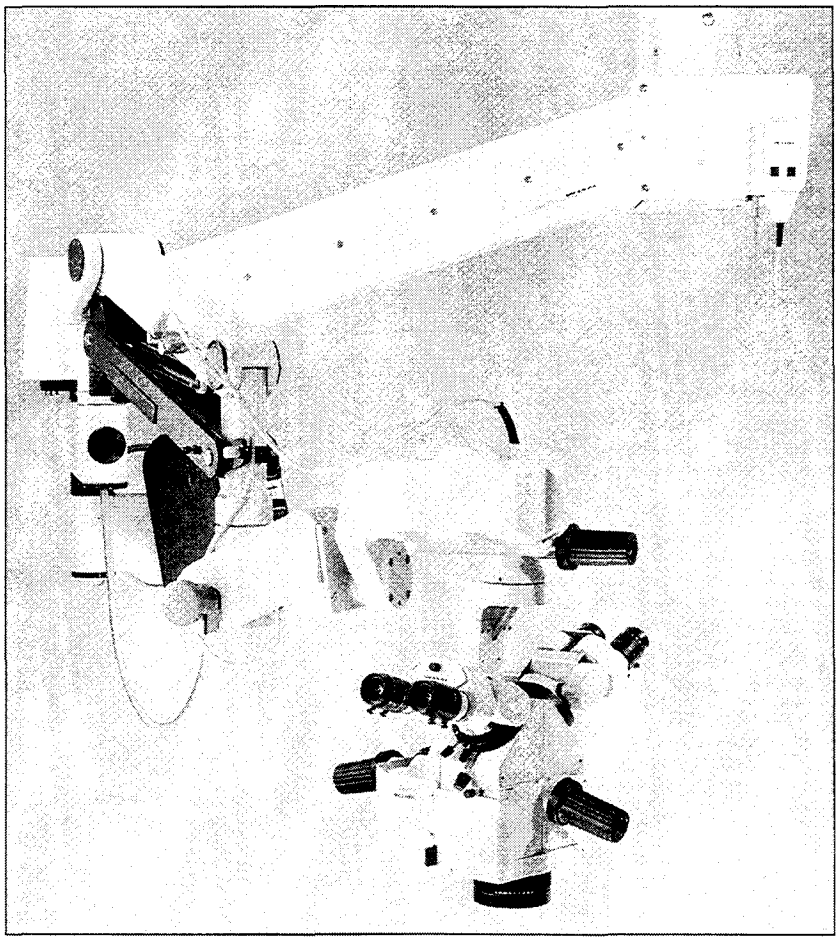
El montaje del estativo de techo y las conexiones eléctricas para el estativo de techo lo regula la **representación Leica.**

Ajuste del portamicroscopio, véase pág. 44.

El **aparato de mando** puede asegurarse en la pared o en el estativo.

Funciones

1 Interruptor principal con lámpara de control.
2 Interruptor manual: elevar/bajar el brazo del estativo.
3 Conexión del interruptor manual.



Fuses
Fusibles:
Sicherungen:
Fusibles:

230 V

T 6,3 A, 5 x 20 mm (167656)
T 0,05 A, 5 x 20 mm (167660)
T 0,5 A, 5 x 20 mm (167650)

115 V

T 6,3 A 6,3 x 32 mm (167673)
T 0,05 A 6,3 x 32 mm (167676)
T 1,0 A, 6,3 x 32 mm (167669)

Notes

Care

Dust and dirt affect the quality of your results.

Therefore:

- Put a **dust cover** over the instrument during breaks in work
- Protect tube openings, tubes without eyepieces, and eyepieces, by means of **dust caps**
- Remove dust with a pneumatic **rubber bulb** or with a **soft brush**
- Clean objectives and eyepieces with special **optics cleaning cloths** and with pure alcohol
- Keep accessories in a **dust-free** place when not in use.

Protect your instruments

- **from damp**, vapours, acids, alkalis and corrosive substances.
- **Do not keep chemicals** near the instrument.
- **from improper handling.**
- Never fit different plugs or dismantle optical systems or mechanical components unless directions for doing so are given in the instructions.
- **from oil and grease.**
- Never oil or grease mechanical parts or sliding surfaces.

Remarques

Entretien

Poussière et crasse affectent la qualité de votre travail!

Donc

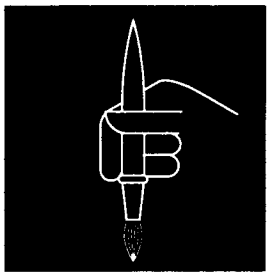
- protégez l'instrument pendant les pauses en le recouvrant de la **housse de protection.**
- protégez les orifices des tubes, les tubes sans oculaire et les oculaires avec des **capuchons.**
- enlevez la poussière à l'aide d'un **soufflet** et d'un **pinceau doux.**
- nettoyez les objectifs et les oculaires avec **un chiffon spécial** et de l'alcool pur.
- rangez les accessoires non utilisés à **l'abri de la poussière.**

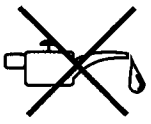
Protégez vos instruments

- **contre l'humidité,** la buée, les acides, les substances alcalines et corrosives.
- Ne conserver **aucun produit chimique** à proximité.
- **contre toute manipulation non appropriée.**

  Ne jamais monter d'autres prises, ni dévisser de composants optiques et pièces mécaniques si cela n'est pas mentionné expressément dans le présent mode d'emploi.
- **contre l'huile et la graisse.**

  Ne jamais lubrifier les surfaces de guidage ni les pièces mécaniques.





Hinweise

Pflege

Staub und Schmutz beeinträchtigen Ihre Arbeitsresultate!

Deshalb

- schützen Sie das Instrument in Arbeitspausen unter der **Staubschutzhülle.**
- schützen Sie Tubusöffnungen, Tubusrohre ohne Okulare und Okulare mit **Staubdeckeln.**
- entfernen Sie Staub mit einem **Blasebalg** und einem weichen **Pinsel.**
- reinigen Sie Objektive und Okulare mit **Optikreinigungstüchern** und reinem Alkohol.
- bewahren Sie nicht benutztes Zubehör **staubfrei** auf.

Schützen Sie Ihre Instrumente

- **vor Nässe**, Dünsten, Säuren, alkalischen und ätzenden Stoffen.

  Bewahren Sie **keine Chemikalien** in der Nähe der Instrumente auf.
- **vor unsachgemässer Behandlung.**

  Niemals dürfen andere Gerätestecker montiert, optische Systeme und mechanische Teile auseinandergeschraubt werden, wenn dies in der Anleitung nicht ausdrücklich beschrieben ist.
- **vor Öl und Fett.**

  Führungsflächen und mechanische Teile dürfen niemals gefettet werden.

Observaciones

Mantenimiento

El polvo y la suciedad influyen negativamente en los resultados de su trabajo

Por ello:

- Cubra los instrumentos con la **funda protectora** durante las pausas de trabajo.
- Cubra con **tapas protectoras** los oculares, las aberturas de los tubos y los tubos sin oculares.
- Quite el polvo de las partes ópticas mediante una **pera de goma** y un **pincel** suave.
- Limpie los objetivos y oculares con alcohol puro y **paños especiales.**
- Mantenga **libres de polvo** los accesorios no utilizados.

Preserve los instrumentos

- **de la humedad**, los vapores, ácidos, álcalis y las sustancias corrosivas.
- **No guarde productos químicos** cerca del instrumento.
- **de manipulaciones inadecuadas.**

  No acople otros enchufes, ni desmonte los sistemas ópticos y las partes mecánicas, a no ser que se mencione explícitamente en el manual de instrucciones.
- **del aceite y las grasas.**

  No engrase nunca las superficies de guía ni las partes mecánicas.

Notes for your safety

Never use the surgical microscope for purposes which have not been described in this user manual.

Stability

Here is how to avoid procedures which could affect the stability of the MS-C floor stand:

Do not use a gas spring stronger than 1100N in the swingarm.

Stronger gas springs will allow the use of too many accessories at the same time, and the loading could topple the stand.

The outfit with floor stand must never be used without an additional weight,

otherwise the stand could topple.

During transport, the swingarm must be folded up and locked, and the brakes must be tight.

Otherwise the swingarm may drift out of control and the stand could topple.

Consignes de sécurité

Ne jamais utiliser le microscope d'opération à d'autres fins que celles décrites dans ce mode d'emploi.

Stabilité

Les erreurs de manipulation mentionnées ci-dessous risquent d'affecter la stabilité du statif de sol MS-C.

La force du ressort pneumatique se trouvant dans le bras mobile ne doit pas dépasser 1100 N.

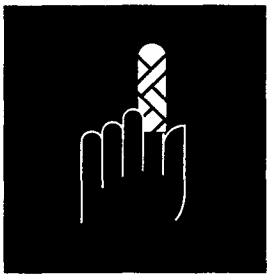
Dans le cas contraire, risque de basculement en raison du poids plus élevé des accessoires!

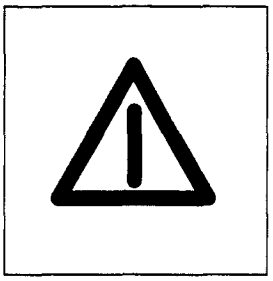
Toujours utiliser un poids supplémentaire avec le statif

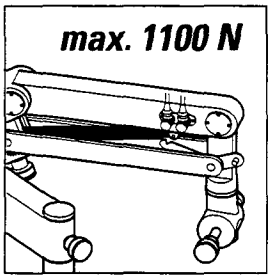
pour éviter tout risque de basculement.

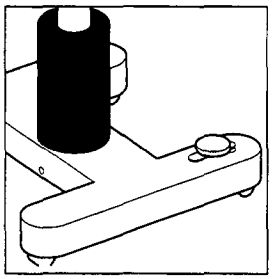
Avant le transport de l'équipement, plier le bras mobile, le bloquer et serrer les freins.

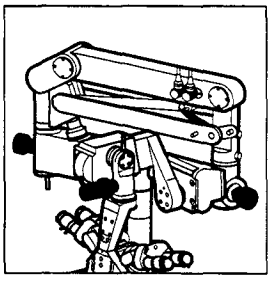
Ceci permet d'éviter un balancement involontaire du bras mobile et, par conséquent, le risque de basculement.











Zu Ihrer Sicherheit

Benutzen Sie das Operationsmikroskop nie für andere, als in dieser Anleitung beschriebene Verwendungszwecke.

Standfestigkeit

In diesem Abschnitt sind Manipulationsfehler aufgeführt, die die Standfestigkeit des Bodenstativs MS-C beeinträchtigen könnten.

Im Schwenkarm darf keine Gasfeder über 1100 N eingesetzt werden.

Die Verwendung stärkerer Gasfedern könnte zu höherem Ausrüstungsgewicht durch Zubehör führen = Kippgefahr!

Die Ausrüstung mit Bodenstativ darf nie ohne Zusatzgewicht verwendet werden.

Ansonsten besteht Kippgefahr.

Beim Transport muss der Schwenkarm zusammengefaltet, blockiert und die Bremsen müssen festgezogen sein.

Andernfalls könnte der Schwenkarm unkontrolliert wegschwenken = Kippgefahr.

Observaciones para su seguridad

No emplee este microscopio para otros menesteres de los descritos aquí.

Estabilidad

En este apartado le presentamos una serie de observaciones que pudieran afectar la estabilidad del estativo de suelo MS-C.

No acople resortes superiores a 1100 N en el brazo móvil.

Resortes más potentes permitirían el empleo simultáneo de demasiados accesorios, por lo que el excesivo peso podría ocasionar el vuelco del instrumento.

No use nunca el equipo con estativo de suelo sin peso adicional.

El instrumento corre peligro de vuelco.

Cuando desplace el equipo, controle si el brazo móvil está bloqueado y plegado, y si los frenos de articulación están echados.

De lo contrario el brazo móvil se movería de forma descontrolada y el instrumento correría peligro de vuelco.

Movable parts
Here is how to avoid manipulations which could cause injury:

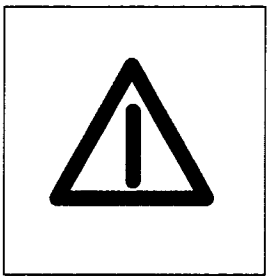
Pièces mobiles
L'utilisateur risque de se blesser s'il ne respecte pas les consignes ci-dessous.

Bewegliche Teile
In diesem Abschnitt weisen wir auf Manipulationen hin, bei denen im Falle von Unachtsamkeit Verletzungsgefahr besteht.

Componentes móviles
Aquí le indicamos cómo evitar manipulaciones que pueden causar daños a personas.

Add accessories and balance the stand before the operation, and never over the field of operation.

Toujours monter les accessoires et équilibrer le microscope avant l'opération et jamais au-dessus du champ opératoire!

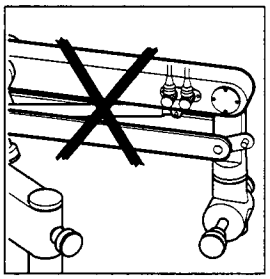


Zubehör zuladen und Ausbalancieren immer vor der Operation und nie über dem Operationsfeld!

Sustituya accesorios y efectúe la compensación del peso del brazo antes de la operación y nunca sobre el campo de operación.

Never put your hand between the gas spring and the swingarm;
it could become trapped when the swingarm is moved.

Ne jamais mettre la main entre le ressort pneumatique et le bras mobile.
Risque de pincement lors de la manipulation du bras mobile.

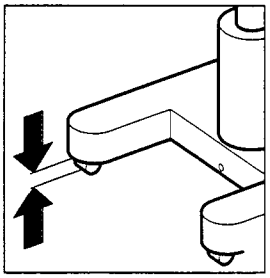


Hand nicht zwischen Gasfeder und Schwenkarm halten.
Sie könnte beim Bewegen des Schwenkarms eingeklemmt werden.

No ponga nunca la mano entre el resorte y el brazo móvil.
Podría pillársela al mover el brazo móvil.

Be careful where you put your feet when you pull the floor stand towards you.
Feet in lightweight shoes could become trapped beneath the casing of the base.

Attention aux pieds lors du déplacement du statif!
Chaussés de souliers légers, ils risquent de passer sous le pied du statif.

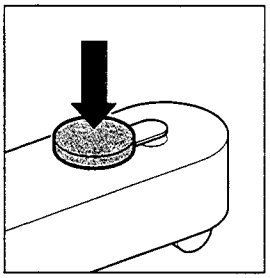


Achten Sie auf Ihre Füsse, wenn Sie das Bodenstativ zu sich heranziehen.
Füsse in leichten Schuhen könnten unter die Verschalung geraten.

Tenga cuidado con los pies, cuando tira del estativo hacia usted.
Si lleva zapatos ligeros puede atrapárselos con facilidad debajo del revestimiento de la base.

The footbrakes must remain engaged throughout the operation.

Les freins du pied doivent être bloqués pendant l'opération.

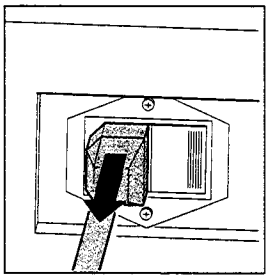


Fussbremsen müssen während der Operation blockiert sein.

Los frenos de pie deben estar bloqueados durante la operación.

Always disconnect the power cable before opening the control unit.

Avant toute manipulation devant être effectuée sur le bloc de commande ouvert, toujours retirer le câble réseau de la prise de courant!

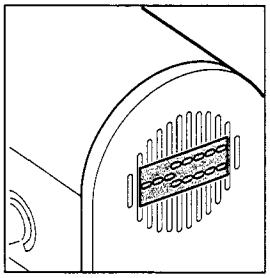


Vor Manipulationen im geöffneten Steuergerät immer erst das Netzkabel vom Netz abziehen!

Cuando deba abrir el aparato de mando, desenchufe, antes de nada, el cable de red.

If your instrument no longer functions satisfactorily,
inspect the light-emitting diodes on the side of the control unit before you contact your Leica agency (see page 39).

Au cas où votre instrument ne fonctionnerait pas correctement,
contrôlez les diodes se trouvant sur le côté du bloc de commande avant d'informer votre représentation Leica (voir page 39).



Falls Ihr Gerät nicht einwandfrei funktioniert,
prüfen Sie bitte zuerst die Leuchtdioden an der Seite des Steuergeräts, bevor Sie Ihre Leica-Vetretung informieren (siehe auch S. 39).

Si su instrumento no funciona perfectamente,
por favor, controle primeramente los diodos luminosos en el lado del aparato de mando, antes de informar a la representación Leica (véase también pág. 39).

Tips and hints

If an electrical fault develops, first check the following:

- Is the voltage selector set correctly (p.47)?
- Is the power switch on (p.14)?
- Is the power cable attached correctly (p.46)?
- Are all connecting cables attached correctly (p.46)?
- Are the fuses in order (p. 47)?

Microscope

The functions cannot be activated with the hand-/footswitch

Assistance

- Inspect the electrical connections (see above)
- Connect the foot-/handswitch to the correct socket (p.62)
- Inspect the diodes on the control unit (p.62): Activate the foot-/handswitch. Do the diodes on the control unit shine?
- Operate the XY-movement manually as an interim measure (p.33).

Note:

- The left key (ML) has no function (p.10).

The surgeons cannot zoom individually

Reason

- The master function is activated (p.15).

Remarques et conseils

En cas de panne des fonctions à commande électrique, vérifier d'abord les points suivants:

- Le sélecteur de tension est-il réglé correctement (p. 47)?
- L'appareil est-il sous tension (p. 14)?
- Le câble réseau est-il branché correctement (p. 46)?
- Les câbles de raccordement sont-ils branchés correctement (p. 46)?
- Les fusibles sont-ils intacts (p. 47)?

Microscope

Les fonctions ne peuvent pas être actionnées avec la commande à pédale/manuelle

Solution

- Contrôler les connexions électriques (voir plus haut)
- Raccorder la commande à pédale/manuelle aux douilles correctes (p. 62)
- Contrôler les diodes du bloc de commande (p. 62): actionner la commande à pédale/manuelle. Les diodes sont-elles allumées?
- Actionner provisoiremcnt les mouvements XY (p. 33).

Attention:

- La touche gauche (ML) est sans effet (p. 10)

Les chirurgiens ne peuvent pas zoomer individuellement

Raison:

- La fonction Master est activée (p. 15)

Hinweise und Ratschläge

Bei Störungen von elektrisch betriebenen Funktionen überprüfen Sie immer erst:

- Ist der Spannungswähler korrekt eingestellt (S.47)?
- Ist der Netzschalter eingeschaltet (S. 14)?
- Ist das Netzkabel richtig angeschlossen (S.46)?
- Sind alle Verbindungskabel richtig angeschlossen (S.46)?
- Sind die Sicherungen intakt (S.47)?

Mikroskop

Die Funktionen können mit Fuss-/Handschalter nicht betätigt werden.

Abhilfe

- Elektrische Verbindungen kontrollieren (s. oben).
- Fuss-/Handschalter an den richtigen Buchsen anschliessen (S.62).
- Dioden am Steuergerät überprüfen (S.62): Fuss-/Handschalter betätigen. Leuchten Dioden am Steuergerät auf?
- XY-Bewegungen vorläufig manuell bedienen (S.33).

Zur Beachtung

- Linke Taste (ML) ist ohne Funktion (S. 10).

Die Chirurgen können nicht individuell zoomen.

Grund

- Die Master-Funktion ist eingeschaltet (S. 15).

Observaciones y consejos

Si se producen fallas de las funciones eléctricas, verifique:

- ¿Está ajustado correctamente el selector de tensión (pág. 47)?
- ¿Está activado el interr.uptor de red (pág. 14)?
- ¿Está enchufado correctamente el cable de red (pág. 46)?
- ¿Están enchufados correctamente todos los cables de conexión (pág. 46)?
- ¿Están los fusibles en correcto estado (pág. 47)?

Microscopio

Las funciones no pueden accionarse con el dispositivo de control por pedal/manual

Remedio

- Controle las conexiones eléctricas (véase arriba).
- Conecte el dispositivo de control por pedal/manual en el enchufe correcto (pág. 62).
- Controle los diodos del aparato de mando (pág. 62): accione el dispositivo de control por pedal/manual. ¿Se ilumina algún diodo del aparato de mando?
- Maneje provisionalmente los movimientos XY de forma manual (pág. 33).

¡Atención!

- La tecla izquierda (ML) no tiene atribuida ninguna función (pág. 10).

Los cirujanos no pueden trabajar con el zoom individualmente

Razón

- La función Master está activada (pág. 15)

The foot-/handswitch controls the functions of the other surgeon instead of those of the user

Assistance

- Connect the footswitch to the correct socket (p.45)
- Inspect the basic microscope position (p.20)
- Set the selector knob correctly (p.21).

Actionnée, la commande à pédale/manuelle agit sur les fonctions de l'autre chirurgien

Solution

- Raccorder la commande à pédale à la douille correcte (p. 45)
- Contrôler la position de base du microscope (p. 20)
- Régler correctement le sélecteur (p. 21)

Mit dem Fuss-/ Handschalter werden nicht die eigenen sondern die Funktionen des anderen Chirurgen betätigt.

Abhilfe

- Fussschalter an den richtigen Buchsen anschliessen (S.45).
- Mikroskop-Grundstellung kontrollieren (S.20).
- Selektorknopf richtig einstellen (S.21).

Con el dispositivo de control por pedal/ manual no se accionan las funciones propias, sino las del otro cirujano

Remedio

- Conecte los dispositivos de control por pedal a los enchufes correctos (pág. 45).
- Controle la posición básica del microscopio (pág. 20).
- Ajuste correctamente el botón de selección (pág. 21).

No light in the microscope

Assistance

- Switch on the illumination with the regulating knob BRIGHTNESS (p.25)
- Inspect the electrical connections (see above, malfunctioning of electrically-powered functions)
- Engage the quick-change lamp mount completely (p. 25)
- Inspect the bulbs, replacing them if defective (p. 49).

Pas de lumière dans le microscope

Solution

- Régler l'éclairage avec le bouton (p. 25)
- Contrôler les connexions électriques (voir plus haut, pannes des fonctions à commande électrique)
- Enclencher le changeur rapide d'ampoule (p. 25)
- Contrôler les ampoules et changer celles qui sont défectueuses (p. 49).

Kein Licht im Mikroskop.

Abhilfe

- Beleuchtung mit Regulierknopf einschalten (S. 25).
- Elektrische Verbindungen kontrollieren (s. oben, Störungen von elektrisch betriebenen Funktionen).
- Lampenschnellwechsler ganz einrasten (S.25).
- Glühlampen kontrollieren evtl. defekte auswechseln (S.49).

No funciona la luz del microscopio

Remedio

- Conecte la iluminación con el botón de regulación (pág. 25).
- Controle las conexiones eléctricas (véase arriba, "fallas de las funciones eléctricas").
- Engrane completamente el cambiador rápido de bombillas (pág. 25).
- Controle las bombillas y sustitúyalas si fuera necesario (pág. 49).

The image is too dark

Assistance

- Turn the BRIGHTNESS knob up high enough (p.34)
- Open the double-iris diaphragms (p.35).

L'image est trop sombre

Solution

- Tourner le bouton de réglage de la luminosité sur la droite (p. 34)
- Ouvrir le double diaphragme iris (p. 35)

Das Bild ist zu dunkel.

Abhilfe

- Regulierknopf hoch genug einstellen (S.34).
- Doppelirisblenden öffnen (S.35).

La imagen resulta demasiado oscura

Remedio

- Gire el botón regulador hacia la derecha (pág. 34).
- Abra los diafragmas iris doble (pág. 35).

The image goes out of focus

Assistance

- Fit the eyepieces correctly (p.49)
- Carry out the dioptric adjustment precisely in accordance with the directions (p.26).

L'image n'est pas nette

Solution

- Introduire les oculaires correctement (p. 49)
- Corriger les dioptries en suivant les instructions (p. 26)

Das Bild bleibt nicht scharf.

Abhilfe

- Okulare richtig einsetzen (S.49).
- Dioptrien-Korrektur genau nach Anweisung durchführen (S.26).

La imagen no permanece nítida

Remedio

- Monte los oculares correctamente (pág. 49).
- Corrija las dioptrías siguiendo atentamente las instrucciones (pág. 26).

Zoom/focus/XY too fast or too slow

Assistance

Adjust the displacement speed (p.19).

Zoom/mise au point trop rapides/trop lents

Solution

Régler les vitesses du zoom et de la mise au point (p. 19)

Zoom/Fokus/XY zu schnell/zu langsam

Abhilfe

Verstellgeschwindigkeiten regulieren (S. 19).

Zoom/enfoque/XY demasiado rápido/lento

Remedio

- Regule las velocidades de ajuste (pág. 19).

The sterile drape produces stray reflections

Assistance

Tilt the objective cover of the drape slightly forwards in relation to the objective mount.

La housse stérile provoque des reflets

Solution

Sur la housse, fixer à l'objectif le capuchon légèrement incliné vers l'avant.

Mit Sterilhülle treten Reflexe auf.

Abhilfe

Objektiv-Abdeckung an der Sterilhülle leicht schräg nach vorn am Objektiv festklemmen.

La cubierta estéril provoca reflejos

Remedio

- En la cubierta, fije la tapa en el objetivo ligeramente inclinada hacia adelante.

Stand

The swingarm drifts upwards or downwards

Assistance
Balance the swingarm (p.29)

TV, photography

The image on the monitor is too dark

Assistance
- Change the filter in the dual attachment (p.39)
- Adjust the video camera / monitor in accordance with the manufacturer's instructions
- For further assistance, refer to the earlier section: "The image is too dark".

Photos are unsharp

Assistance
- Focus precisely (p.17)
- Carry out the dioptric adjustment precisely in accordance with the directions (p.26).

Photos have a yellow cast

Assistance
- Use artificial-light film
- Turn the rotary knob clockwise to maximum voltage (p.25)
- If using daylight film, insert a KB12 filter into the microscope (p.25).

Statif

Le bras horizontal se relève/s'abaisse de lui-même

Solution
- Equilibrer le bras mobile (p. 29).

TV, photographie

L'image de l'écran est trop sombre

Solution
- Changer le filtre dans la rallonge double (p. 39)
- Régler correctement la caméra vidéo/le moniteur (suivre les instructions du fabricant)
- Voir aussi "L'image est trop sombre".

Les photographies ne sont pas nettes

Solution
- Faire une mise au point précise (p. 17)
- Corriger les dioptries en suivant les instructions (p. 26)

Les photographies ont une nuance jaune

Solution
- Utiliser un film lumière artificielle
- Tourner le bouton de réglage, dans le sens des aiguilles d'une montre, sur la tension maximale (p. 25)
- Avec un film lumière du jour, utiliser un filtre KB12 dans le microscope (p. 25).

Stativ

Der Schwenkarm hebt/senkt sich selbständig.

Abhilfe
- Schwenkarm ausbalancieren (S.29).

TV, Photographie

Das Bild auf dem Bildschirm ist zu dunkel.

Abhilfe
- Filter im Dualansatz wechseln (S.39).
- Video-Kamera/Monitor korrekt einstellen (Anleitung des Herstellers).
- Weitere Massnahmen siehe 'Bild ist zu dunkel'.

Photographien sind unscharf.

Abhilfe
- Präzise Fokussieren (S. 17).
- Dioptrien-Korrektur genau nach Anweisung durchführen (S.26).

Photographien haben Gelbstich

Abhilfe
- Kunstlichtfilm verwenden.
- Regulierknopf im Uhrzeigersinn auf Maximalspannung drehen (S.25).
- Bei Tageslichtfilm Filter KB12 im Mikroskop einsetzen (S.25).

Estativo

El brazo móvil se inclina/levanta por sí mismo

Remedio
- Equilibre el brazo móvil (pág. 29).

TV, fotografía

La imagen del monitor resulta demasiado oscura

Remedio
- Sustituya el filtro en el suplemento dual (pág. 39).
- Ajuste correctamente la videocámara/el monitor (siga las instrucciones del fabricante).
- Véase también "la imagen resulta demasiado oscura".

Las fotografías no son nítidas

Remedio
- Enfoque con más precisión (pág. 17).
- Efectúe la corrección de dioptrías siguiendo atentamente las instrucciones (pág. 26).

Las fotografías presentan un matiz amarillo

Remedio
- Emplee una película para luz artificial.
- Gire el botón de regulación en dirección de las agujas del reloj hasta la tensión máxima (pág. 25).
- Si emplea un filtro para luz natural monte un filtro KB12 en el microscopio (pág. 25).

Notes

We guarantee the quality

You are working with a high-performance precision instrument which meets the highest requirements.

Consequently, we guarantee the quality of our instruments. The guarantee covers all faults in materials and manufacture. It does not, however, cover damage resulting from careless or improper handling.

Please handle your valuable optical instrument with respect. It will then fulfil its function with the same precision for decades. Our instruments are renowned for that.

If your instrument no longer functions satisfactorily, call in your Leica agent or contact Leica AG, Heerbrugg, Switzerland.

Remarques

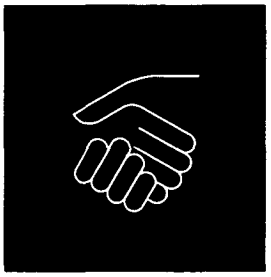
Nous nous portons garants de la qualité

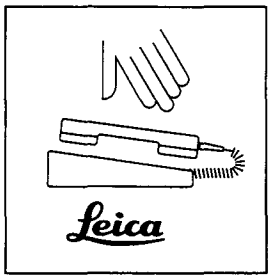
Vous travaillez avec un instrument de précision performant qui répond aux plus hautes exigences.

Ainsi, nous garantissons la qualité de nos instruments. Cette garantie couvre les vices de fabrication et de matériaux, mais exclut tout dommage dû à la négligence et à une manipulation inappropriée.

Utilisez votre microscope d'opération avec le plus grand soin. Il vous rendra service pendant des dizaines d'années tout en conservant sa précision. Une qualité pour laquelle nos instruments sont réputés.

Si votre instrument ne fonctionne plus correctement, adressez-vous à votre représentation Leica ou directement à Leica AG, Heerbrugg, Suisse.





Hinweise

Wir garantieren für Qualität

Sie arbeiten mit einem Präzisionsinstrument grosser Leistungsfähigkeit, das höchsten Ansprüchen gerecht wird.

Dementsprechend bürgen wir für die Qualität unserer Instrumente. Die Garantie erstreckt sich auf Fabrikations- und Materialfehler, nicht aber auf Schäden, die durch Fahrlässigkeit und unsachgemässe Handhabung entstanden sind.

Bitte behandeln Sie Ihr wertvolles optisches Instrument mit gebührender Sorgfalt. Dann erfüllt es über Jahrzehnte seinen Dienst mit gleichbleibender Genauigkeit. Dafür sind unsere Instrumente berühmt.

Sollte Ihr Instrument nicht mehr einwandfrei funktionieren, wenden Sie sich bitte an Ihre Leica Vertretung oder an Leica AG, Heerbrugg, Schweiz.

Observaciones

Respondemos de la calidad

Tiene en sus manos un instrumento de precisión de grandes prestaciones que responde a las exigencias de calidad más estrictas.

Garantizamos la calidad de nuestros instrumentos. Sin embargo, nuestra garantía sólo cubre los defectos de fabricación o de material, pero no los daños causados por descuidos o manipulaciones incorrectas.

Trate su instrumento con sumo cuidado. Sólo así prestará sus servicios durante muchos años con la misma precisión que ha hecho famosos a nuestros instrumentos.

Si el instrumento no funciona correctamente, diríjase a la representación local o directamente a Leica AG, Heerbrugg, (Suiza).

Notes

Technical data

Only the following accessories may be connected to the control unit:

1. Tested Leica accessories
2. Accessories passed as safe to use by an approved testing station

Power supply
Primary
115 V/230 V~
+10% -15% 50/60 Hz

Fuses:
2×1.6AT (5×20mm)

Safety class
Type B Class 1

Output
Secondary
24V = 5A
Microscope: WILD M680
for lamp type:
Fuse 6.3AT
(5×20mm) 12V/50W

Care!
The control unit was set to **230V grid voltage** in the factory. To change the grid voltage setting, refer to page 47.

Pull out the cable before you open the control unit.

Use the instrument only in medically-designated rooms in accordance with VDE0107. Do not use the instrument where there is the danger of explosion.

Remarque

Dates técnique

Ne brancher que les éléments suivants au bloc de commande:

1. Accessoires Leica homologués
2. Accessoires dont la compatibilité est attestée par un centre de contrôle agrée

Connexion au réseau
Primaire
115 V/230 V~
+10% -15% 50/60 Hz

Fusible
2×1.6 AT (5×20 mm)

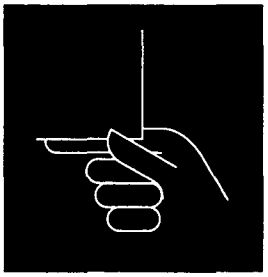
Classe de protection
Typ B classe 1

Sortie
Secondaire
24 V = 5 A
Microscope: WILD M680
pour type de lampe:
fusible 6.3 AT
(5×20 mm) 12 V/50 W

Attention!
Le bloc de commande a été ajusté en usine pour une **tension de réseau 230 V.** Pour changer la tension, voir page 47.

Avant d'ouvrir le bloc de commande, débrancher le câble réseau.

L'instrument ne doit être utilisé que dans des locaux à usage médical répondant à la norme VDE 0107 et non pas dans des zones explosives.



Hinweise

Technische Daten

Am Steuergerät darf ausschliesslich folgendes Zubehör angeschlossen werden:

1. Geprüftes Zubehör der Firma Leica.
2. Zubehör, dessen sicherheitstechnisch unbedenkliche Verwendungsfähigkeit durch eine zugelassene Prüfstelle nachgewiesen ist.

Netzanschluss
Primär
115 V/230 V~
+10% -15% 50/60 Hz

Sicherung
2×1.6 AT (5×20 mm)

Schutzklasse
Typ B Klasse 1

Ausgang
Sekundär
24 V = 5 A
Mikroskop: WILD M680
für Lampentyp:
Sicherung 6.3 AT
(5×20 mm) 12 V/50 W

Achtung!
Das Steuergerät wurde im Werk auf **Netzspannung 230 V** eingestellt.
Umschaltung der Netzspannung siehe Seite 47.

Vor dem Öffnen des Steuergerätes Netzkabel ziehen.

Verwendung des Gerätes nur in medizinisch genutzten Räumen nach VDE 0107. Betrieb des Gerätes nicht in explosionsgefährdetem Bereich.

Observaciones

Datos tecnicos

En el aparato de mando pueden conectarse únicamente los siguientes accesorios:

1. Accesorios controlados por la compañía Leica.
2. Accesorios que, aprobados por un centro de ensayos autorizado, garantizan una seguridad técnica completa, a la hora de ser manipulados.

Conexión de red
Primario
115 V/230 V~
+10% -15% 50/60 Hz

Fusibles
2×1.6 AT (5×20 mm)

Clase de protección
Tipo B clase 1

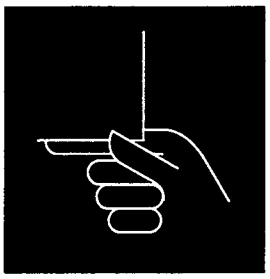
Salida
Secundario
24 V = 5 A
Microscopio: WILD M680
para tipo de bombilla:
fusible 6.3 AT
(5×20 mm) 12 V/50 W

¡Atención!
El aparato de control viene ajustado de fábrica para una **tensión de red de 230 V.** Para cambiar la tensión, consulte pág. 47.

Antes de abrir el aparato de mando, desenchufe el cable de red.

No emplee el instrumento sino en recintos de uso médico exclusivamente. Absténgase de utilizar el instrumento en zonas con peligro de explosión.

Optical data *Données optiques* *Optische Daten* *Datos ópticos*



Eyepieces / Oculaires / Okulare / Oculares	Zoom	Objective / Objectif / Objektiv / Objectivo							
		f = 200 mm		f = 250 mm		f = 300 mm		f = 350 mm	
		Working distance / Distance de travail / Arbeitsabstand / Distancia de trabajo 180 mm		Working distance / Distance de travail / Arbeitsabstand / Distancia de trabajo 233 mm		Working distance / Distance de travail / Arbeitsabstand / Distancia de trabajo 287 mm		Working distance / Distance de travail / Arbeitsabstand / Distancia de trabajo 341 mm	
		Total magnification / Grossissement total / Totalvergrösserung / Aumento total	Field diameter / Champ visuel Ø / Gesichtsfeld Ø / Campo visual Ø mm	Total magnification / Grossissement total / Totalvergrösserung / Aumento total	Field diameter / Champ visuel Ø / Gesichtsfeld Ø / Campo visual Ø mm	Total magnification / Grossissement total / Totalvergrösserung / Aumento total	Field diameter / Champ visuel Ø / Gesichtsfeld Ø / Campo visual Ø mm	Total magnification / Grossissement total / Totalvergrösserung / Aumento total	Field diameter / Champ visuel Ø / Gesichtsfeld Ø / Campo visual Ø mm
10x / 21B	5	2.5	84	2	105	1.7	126	1.4	147
	6.25	3.1	67.2	2.5	84	2.1	100.8	1.8	117.6
	8	4	52.5	3.2	65.6	2.7	78.8	2.3	91.9
	10	5	42	4	52.5	3.3	63	2.9	73.5
	12.5	6.3	33.6	5	42	4.2	50.4	3.6	58.8
	16	8	26.3	6.4	32.8	5.3	39.4	4.6	45.9
	20	10	21	8	26.3	6.7	31.5	5.7	36.8
	25	12.5	16.8	10	21	8.3	25.2	7.1	29.4
16x / 14B	5	4	56	3.2	70	2.7	84	2.3	98
	6.25	5	44.8	4	56	3.3	67.2	2.9	78.4
	8	6.4	35	5.1	43.8	4.3	52.5	3.7	61.3
	10	8	28	6.4	35	5.3	42	4.6	49
	12.5	10	22.4	8	28	6.7	33.6	5.7	39.2
	16	12.8	17.5	10.2	21.9	8.5	26.3	7.3	30.6
	20	16	14	12.8	17.5	10.7	21	9.1	24.5
	25	20	11.2	16	14	13.3	16.8	11.4	19.6
25x / 9.5B	5	6.3	38	5	47.5	4.2	57	3.6	66.5
	6.25	7.8	30.4	6.3	38	5.2	45.6	4.5	53.2
	8	10	23.8	8	29.7	6.7	35.6	5.7	41.6
	10	12.5	19	10	23.8	8.3	28.5	7.1	33.3
	12.5	15.6	15.2	12.5	19	10.4	22.8	8.9	26.6
	16	20	11.9	16	14.8	13.3	17.8	11.4	20.8
	20	25	9.5	20	11.9	16.7	14.3	14.3	16.6
	25	31.3	7.6	25	9.5	20.8	11.4	17.9	13.3

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WILD M695
WILD M690/Mitaka

ENT

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M2 680 – VII.93

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M680 fault finding

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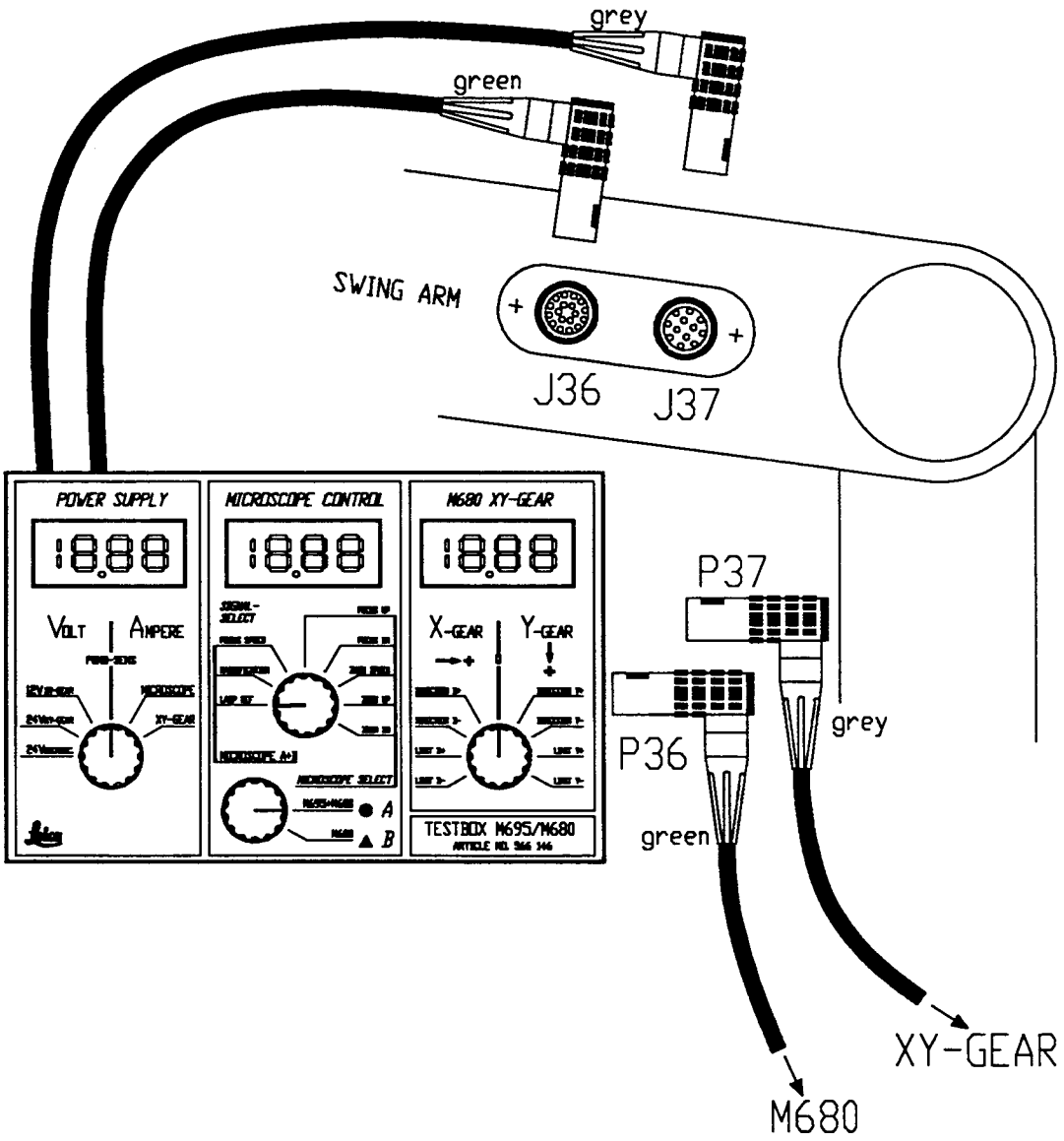
Supply of microscope and XY-gear	4-5
Lamp control	4-7
Zoom control	4-8
Focus control	4-9
X(Y)-gear	4-10

M680 Fault finding

Preparation

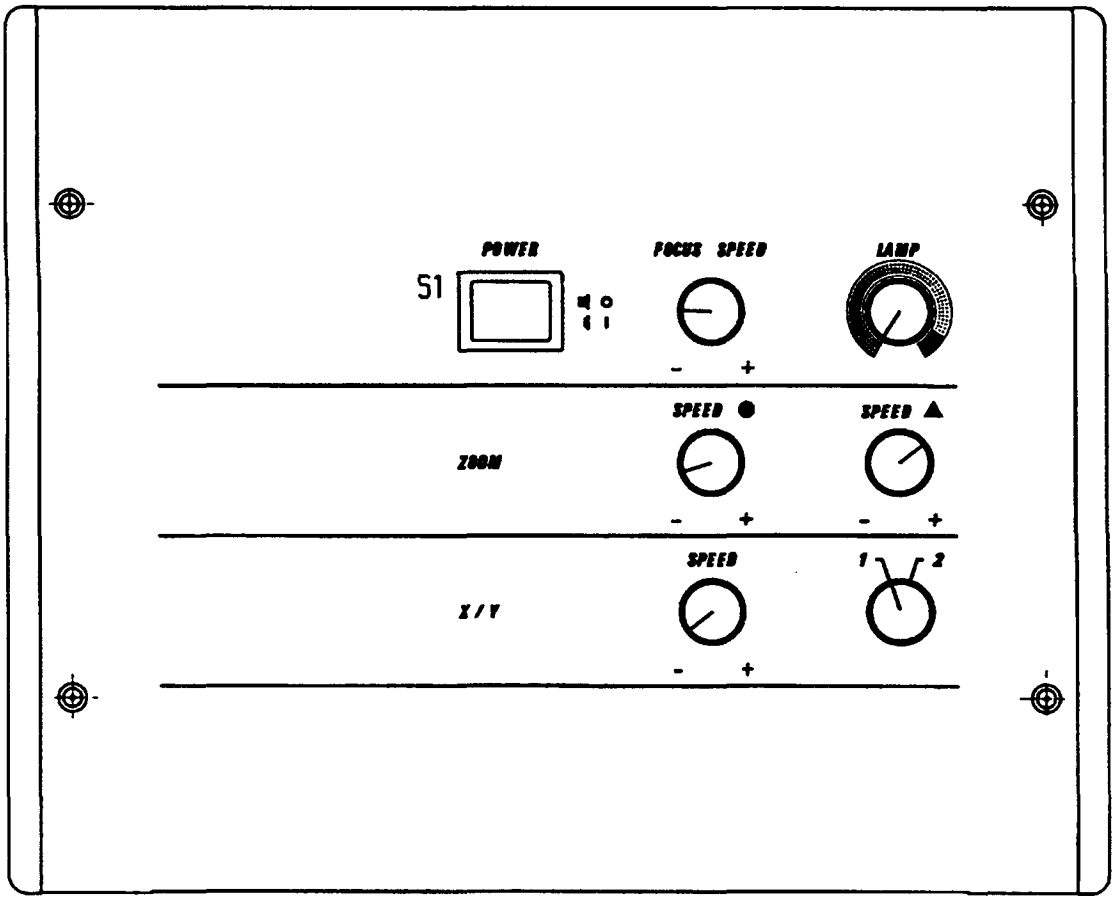
1. Connecting the testbox

- Disconnect plugs P36 und P37 from swingarm
- Hook in the testbox to the swingarm
- Plug in P36 and P37 at the testbox. With that the control unit is connected with microscope and XY-gear through the testbox.



2. Settings on the control unit

- Adjust Lamp to minimal brightness
- Set Position switch to "1"



Power supply of control unit

Action	Reaction	Possible reason	Check
SWITCHING ON	Lamp of main switch does not light	Line voltage	Fuses F1 and F2 in line plug P1 Main switch S1 Line cable
	5V-LED on Function-Display does not light	24V-main supply	Transformer Rectifier circuit Wiring
		10V-supply	Panel board
		5V-supply	Receiver board
	Zoom does not move to position 5 and subsequently to 9	Control unit, Swingarm or microscope	Zoom control page 4-8
	Focus does not move to center position	Control unit, Swingarm or microscope	Focus control page 4-9

Functions of hand- or footswitch

Condition: Malfunction of hand- or footswitch of only one side, A or B, is .

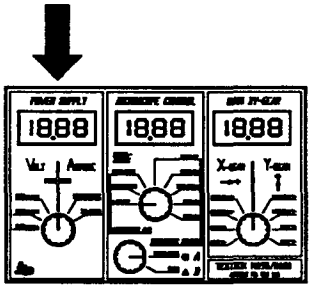
- ***Fault appeares at side A:*** positionswitch at "1"
- ***Fault appeares at side B:*** set positionswitch to "2"
- ***Replace hand- or footswitch of the defective side A or B*** by either:

  a) Service-handswitch or

  b) Hand-/footswitch of the opposit side

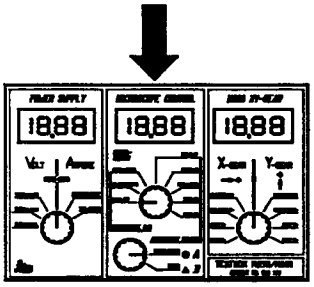
Action	*Reaction*	*Possible reason*
Release functions: SL← (Z) SL→ (F) X← X→ Y↑ Y↓ Z↑ Z↓ F↑ F↓	Corresponding LED at Function Display does not light	Receiver Board
Connect again original switch and ***release functions***	Corresponding LED at Function Display does not light	Hand- or footswitch
Imprtant: Set positionswitch back to "1"!		

Supply of microscope and XY-gear



Voltage	*Action*	*Reading*	*Reaction*	*Possible fault*
24V MICRO	1.Lamp to min.brightness 2.Lamp to max.brightness 3.Lamp back to min. brightness	26V +-5% 20V +-5%	Microscope reacts - but incorrect	Check supply-lines of 24V and check PGND - page 4-6
			Microscope without any function	Wiring of microscope
	Switch off, bridge swing-arm with servicecable and switch on again	26V +-5%	microscope reacts	Swingarm cable
	Switch off, Separate microscope from testbox and switch on	26V +-5%	Voltage ok	evtl. short circuit in the microscope
			Voltage not ok	Control unit
24V$_{XY-GEAR}$	Lamp to min.brightness	26V +-5%	Voltage ok and XY-Gear does'nt react	Check 12V$_{XY-GEAR}$ page 4-6
	Bridge swing-arm with servicecable	26V +-5%	Voltage ok and XY-gear reacts	Swingarm cable
			Voltage not ok	Control unit

Voltage	Action	Reading	Reaction	Possible fault
12V XY-GEAR	1. Zoom position 25 min. XY-speed	5.2V +-0.3V	Voltage ok but XY-gear reacts incorrect	verify control signals of the XY-gear page 4-10
	2. Zoom position 5 max. XY-speed	14.5V+-0.6V		
			Voltage not ok	Control unit (XY-servo); XYmotor short circuit

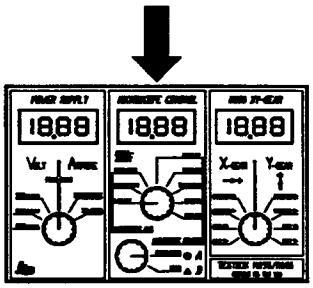


Check lines of Powerground PGND
(Voltage drop on PGND relating to logic ground)

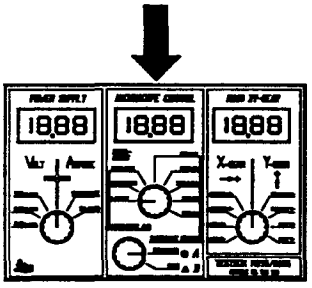
FOCUS UP	Adjust lamp to maximal brightness	max. -0.8V with standard-swingarm cable	If voltage is ok - depending on the incorrect function, check signals of: Lamp control - page 4-7 Zoom control - page 4-8 Focus control - page 4-9	
	Bridge swingarm with service cable and adjust lamp to max. brightness	max. -0.8V	Voltage ok	Swingarm cable (One of the two PGND-lines is broken)
			Voltage not ok typ. >-1V	One of the two PGND-lines in the microscope or control unit is broken.

Important: Adjust lamp again to minimal brightness!

Lamp control



Signal	Action	Reading	Reaction	Possible fault
LAMP REF	Adjust lamp to min./max brightness	0.3V ... 5V +-5%	Voltage ok	Microscope (Lamp Control, Wiring)
	Separate microscope from the testbox, adjust lamp to min./max brightness	0.3V ... 5V +-5%	Voltage ok	Microscope
	Bridge swingarm with service cable, adjust lamp to min./max brightness	0.3V ... 5V +-5%	Voltage ok	Swingarm cable
			Voltage not ok	Control unit
	Important: Adjust lamp again to minimal brightness!			

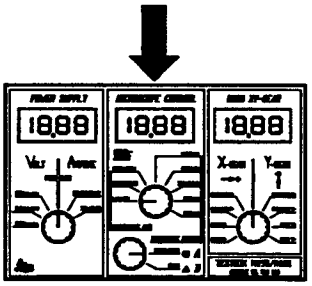


Zoom control

Select microscope side A or B:

- Select A or B, depending on which side the zoom works incorrect
- Select A if the fault appeares on both sides, A and B.

Signal	Action	Reading	Reaction	Possible fault
A / B ZOOM SPEED	Set min. zoom speed Set max. zoom speed	1.84 ... 2.34V 5V +-5%		
A/B ZOOM UP	Release Z↑ on hand-/footswitch A/B	>4.75V	Voltages ok, but reacts incorrect	Microscope (Logic board, Zoom servo, wiring)
	non-actuated	<0.2V		
A/B ZOOM DN	Release Z↓ on hand-/footswitch A/B	>4.75V		
	non-actuated	<0.2V		
	Separate microscope from the testbox and check signals	see above	Voltages ok	Microscope (short circuit on Logic board, Zoom servo or wiring)
	Bridge swingarm with servicecable and verify signals	see above	Voltages ok	Swingarm cable
			Voltages not ok	Control unit



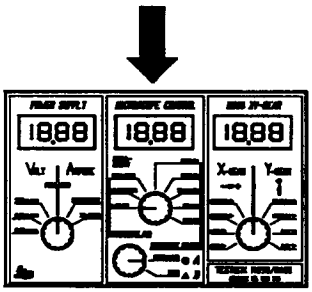
Focus control

Select microscope side A or B:

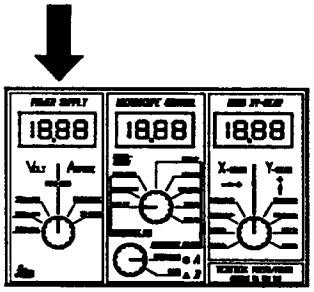
- Select A or B, depending on which side the zoom works incorrect
- Select A if the fault appeares on both sides, A and B.

Signal	Action	Reading	Reaction	Possible fault
A/B FOCUS SPEED	Set min. focus speed Set max. focus speed	1.25 ... 1.27V 5V +-5%		
A/B FOCUS UP	Release F↑ on hand-/footswitch A/B	>4.75V	Voltage ok, but reacts incorrect	Microscope (Logic board, Focus servo, wiring)
	non-actuated	<0.2V		
A/B FOCUS DN	Release F↓ on hand-/footswitch A/B	>4.75V		
	non-actuated	<0.2V		
	Separate microscope from the testbox and check signals	see above	Voltages ok	Microscope (short circuit on Logic board, Focus servo or wiring)
	Bridge swingarm with servicecable and verify signals	see above	Voltages ok	Swingarm-cable
			Voltages not ok	Control unit

X(Y)-gear

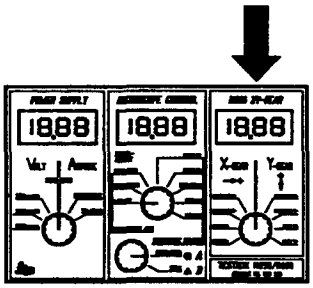


Signal	Action	Reading	Reaction	Possible fault
MAGNIFICATION	Set zoom position 25	4V +-0.5V		
	Set zoom position 5	0V +-0.5V	Voltages not ok but display on Select board shows correct zoom position	Microscope (Zoom servo)
			Voltages not ok and display on Select board shows any wrong zoom position	Microscope (Logic board od. Zoom servo)



- Move the microscope to the centre of X- and Y-range - manually if necessary (see user manual)

AMPERE XY-GEAR	Release X→, X←, Y↑, Y↓ at Hand-/Fussschalter A	0.7A =current-limit	no reaction of the direction released	XY-Gear mechanically blocked
		>0.35A	eventually unusual noise is audible	mechanical problem in the gearbox



Signal	*Action*	*Reading*	*Reaction*	*Possible fault*
DIRECTION X+ ***DIRECTION Y+***	Release X→ (Y↑)at hand-/fcootswitch A	same value as $12V_{XY}$-0.2V see page 4-6	Voltages ok, but does not react	X(Y)-gearbox (XY_GND, Limit board, X(Y)-motor)
DIRECTION X- ***DIRECTION Y-***	Release X← (Y↓) at hand-/footswitch A			
LIMIT X+ ***LIMIT Y+***	Release X→ (Y↑) at hand-/footswitch A	0.0V +0.2V		
LIMIT X- ***LIMIT Y-***	Release X← (Y↓) at hand-/footswitch A			
	bridge swingarm with service cable and verify the signals	as above	voltages ok	Swingarm cable
			voltages not ok	Control unit (XY-servo)

Table of content

Description of functions
MEL61/62 control unit

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Power supply	5-3
Lamp control	5-9
Zoom control	5-11
Focus control	5-17
XY-gear control	5-23

Description of functions MEL61/62 control unit

The description is subdivided for the main groups:

- Control unit MEL61/62 - Section 5
- Swingarm MSV136/137 - Section 6
- M680 microscope - Section 7
- XY-gear MSV138 - Section 8

The control circuits for zoom, focusing and XY-gear

are located partly in the control unit and partly in the microscope itself. Their functions are described in the following pairs of sections:

- 5 and 7 for microscope functions
- 5 and 8 for XY-gear

The swingarm cable

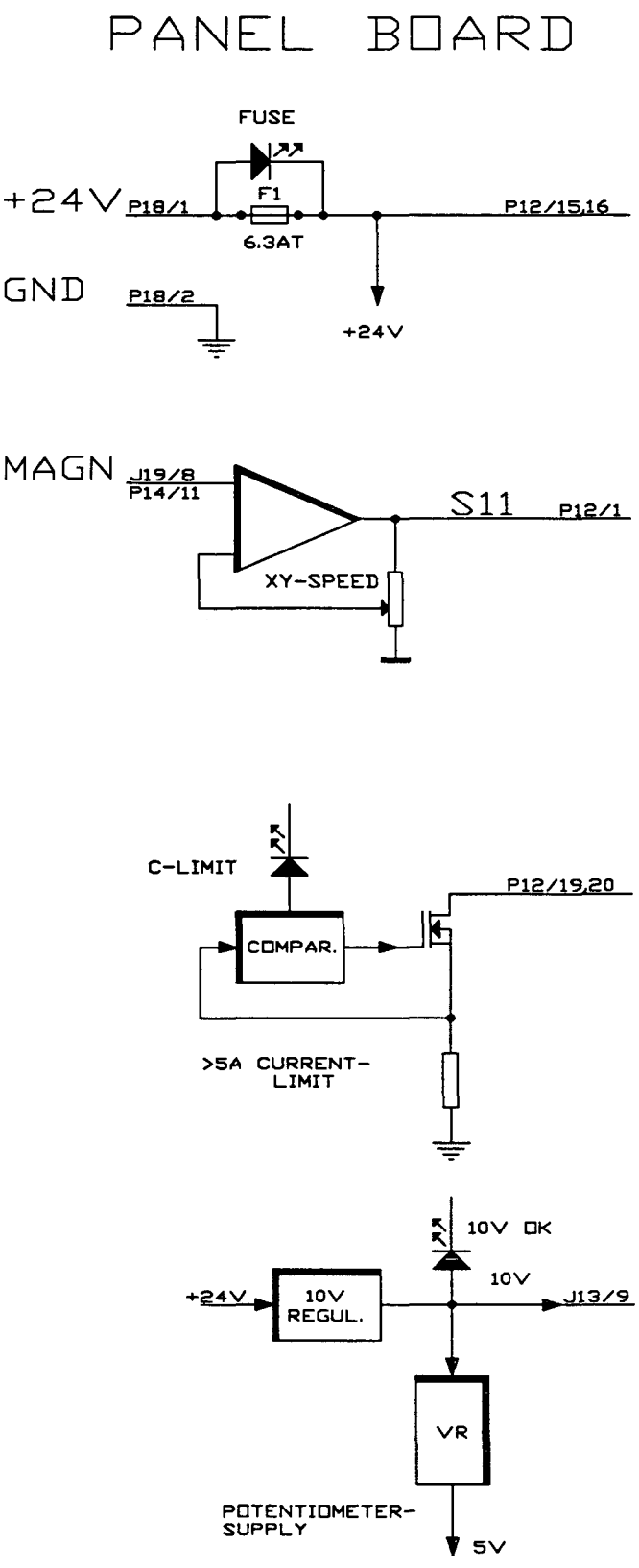
is the electrical link between the control unit, the microscope and the XY-gear, and is therefore the ideal place to start looking for faults at the level of the main groups.

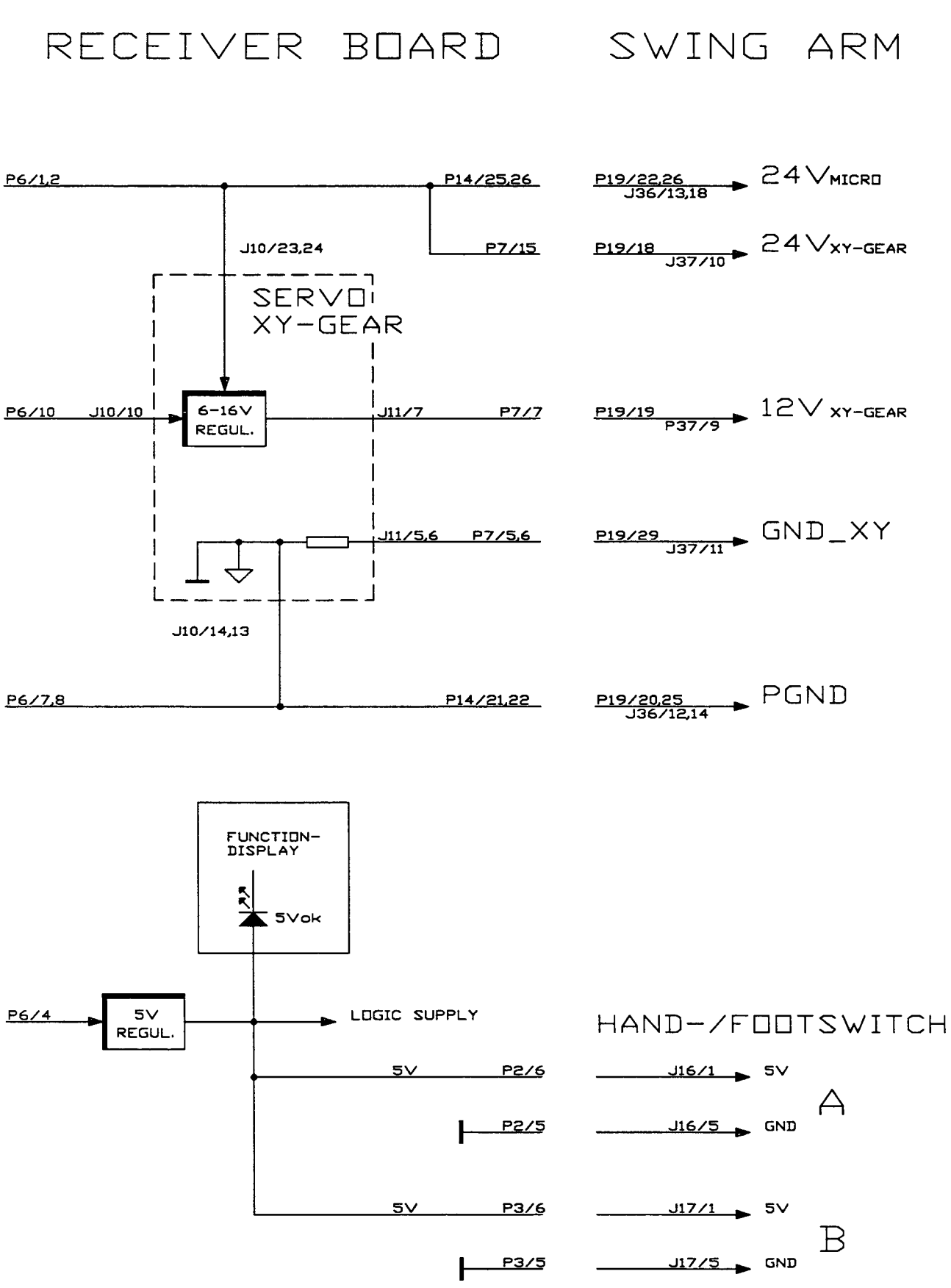
The test box is introduced between the swingarm and the microscope. It can be used to study the supply voltages, control signals and control levels, all of which are transmitted through the swingarm cable. Section 6 includes a list of these signals.

Notes

Power supply MEL61/62

Tasks	Control elements / displays	Pages
24V supply for microscope and XY-gear	Red LED on panel board indicates defective fuse	5-6, 7-4
12V supply for final stage XY-servo	Variable with XY-speed potentiometer	5-6
10V supply for potentiometer and receiver board	Green LED on panel board shows 10V OK	5-7
5V supply for logics of receiver board and footswitch or handswitch	LED "5V" OK on function display	5-7
5V supply for logics board in microscope		7-4
Ground		
PGND: Microscope ground	Yellow LED on panel board indicates switch-off caused by excess current	5-7, 7-4
SENS	Logics (ground) microscope	5-7, 7-4
GND_XY: XY ground		5-7


PANEL BOARD
FUSE
+24V
P18/1
F1
6.3AT
P12/15,16
GND
P18/2
+24V
MAGN
J19/8
P14/11
S11
P12/1
XY-SPEED
C-LIMIT
P12/19,20
COMPAR.
>5A CURRENT-
LIMIT
10V OK
10V
+24V
10V
REGUL.
J13/9
VR
POTENTIOMETER-
SUPPLY
5V


RECEIVER BOARD
SWING ARM
P6/1,2
P14/25,26
P19/22,26
J36/13,18
24VMICRO
J10/23,24
P7/15
P19/18
J37/10
24VXY-GEAR
SERVO
XY-GEAR
P6/10
J10/10
6-16V
REGUL.
J11/7
P7/7
P19/19
P37/9
12V XY-GEAR
J11/5,6
P7/5,6
P19/29
J37/11
GND_XY
J10/14,13
P6/7,8
P14/21,22
P19/20,25
J36/12,14
PGND
FUNCTION-
DISPLAY
5Vok
P6/4
5V
REGUL.
LOGIC SUPPLY
HAND-/FOOTSWITCH
5V
P2/6
J16/1
5V
A
P2/5
J16/5
GND
5V
P3/6
J17/1
5V
B
P3/5
J17/5
GND

Control-LEDs

On the panel board:

10V OK: green LED shines
>5A on 24V (PGND): yellow LED shines
Fuse interrupted: red LED shines

and on the function display:

5V OK: green LED shines

24V supply

The 24V supply powers the servo board via the receiver board, and the microscope via the swingarm.

The fuse for the unstabilized main supply voltage is on the panel board (6.3AT). The red LED indicates a burnt fuse.

Limitation of excess current

The loading at maximum lamp brightness is about 3.25A. The yellow LED on the panel board indicates switching off as a result of excess current (5A) at PGND.

12V supply

A switching regulator on the servo board produces a 12V supply for the X- and Y-motors. The voltage varies, depending on the XY-speed and zoom position (MAGN) set.

	at min. XY-speed	*at max. XY-speed*
Zoom position 25	5.2V	8.5V
Zoom position <8	9V	14.5V

10V supply

A switching regulator on the panel board reduces the 24V to 10V. The power for the potentiometer (5V) is derived from it. The 5V regulator on the RECEIVER BOARD is supplied with 10V.

5V supply Receiver board

An LED on the function display shows 5V OK. The following are supplied with power: Handswitch or footswitch, and logics on receiver board.

PGND, SENS and logics ground

Microscope ground (PGND) and SENS are connected in the microscope. The high lamp current produces a voltage drop of about 0.6V at PGND. This voltage is passed to the control unit through SENS.

For the reason indicated above, Logic ground is about 0.6V below PGND in the microscope. The voltage drop at PGND influences the level of the control signals.

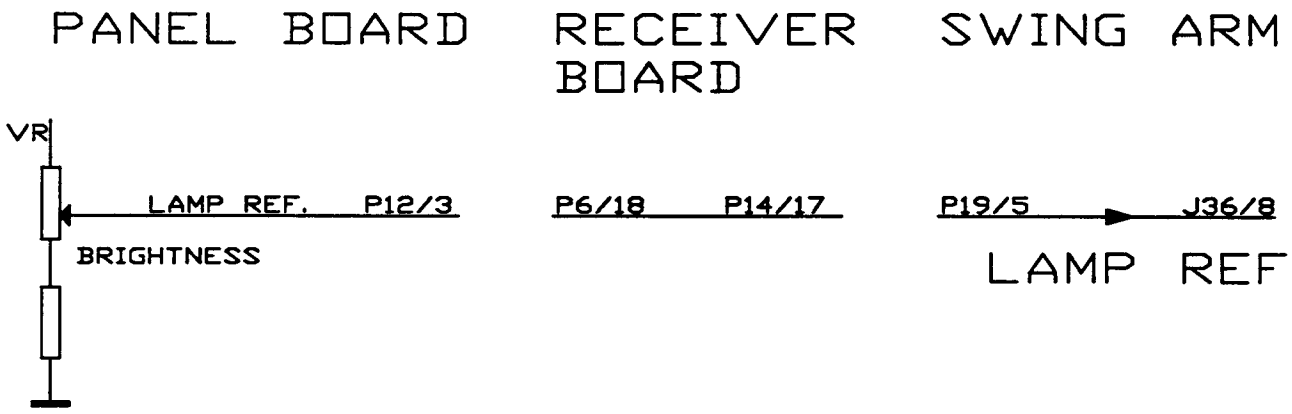
SENS

All control signals to the microscope are measured with the testbox in relation to SENS. SENS is connected to GND of panel board through a 20-Ohm resistance.

Notes

Lamp control MEL61/62

Tasks	Control element / display	Pages
Setting the lamp brightness	Potentiometer on control unit	5-10, 7-6
Limiting excess current	Measurement resistor on LAMP CONTROL in microscope	7-6
Inspect spare bulb	LED on microscope flashes if spare bulb is defective or if quick-change lamp mount is disengaged.	7-6



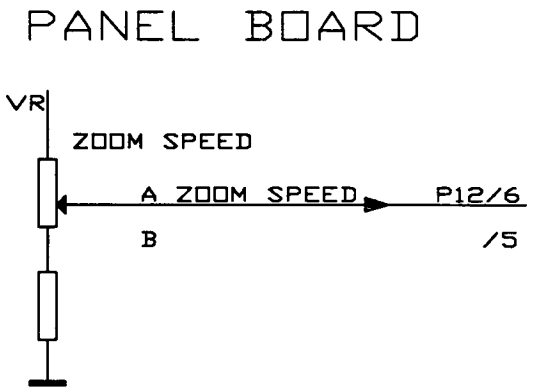
Reference for lamp regulator

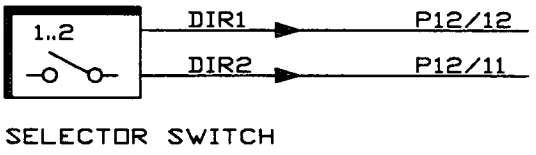
The voltage level LAMP REF depends on the position of the brightness potentiometer. LAMP REF is passed via the receiver board and the swingarm cable to the lamp control board in the microscope, where it forms the reference value (required value) of the lamp regulator.

	LAMP REFerence
Min. brightness	0.3V +-5%
Max. brightness	5.0V +-5%

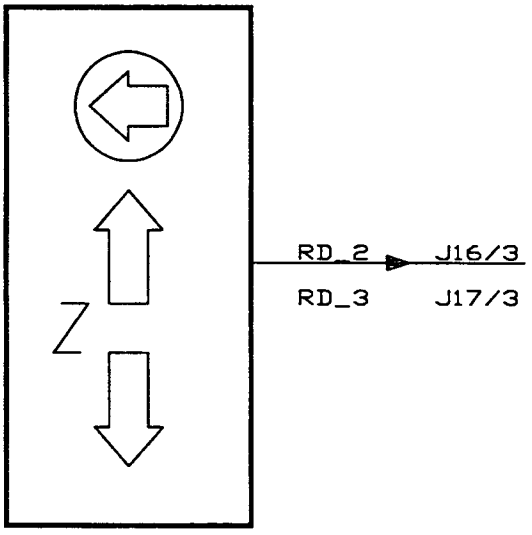
Zoom control MEL61/62

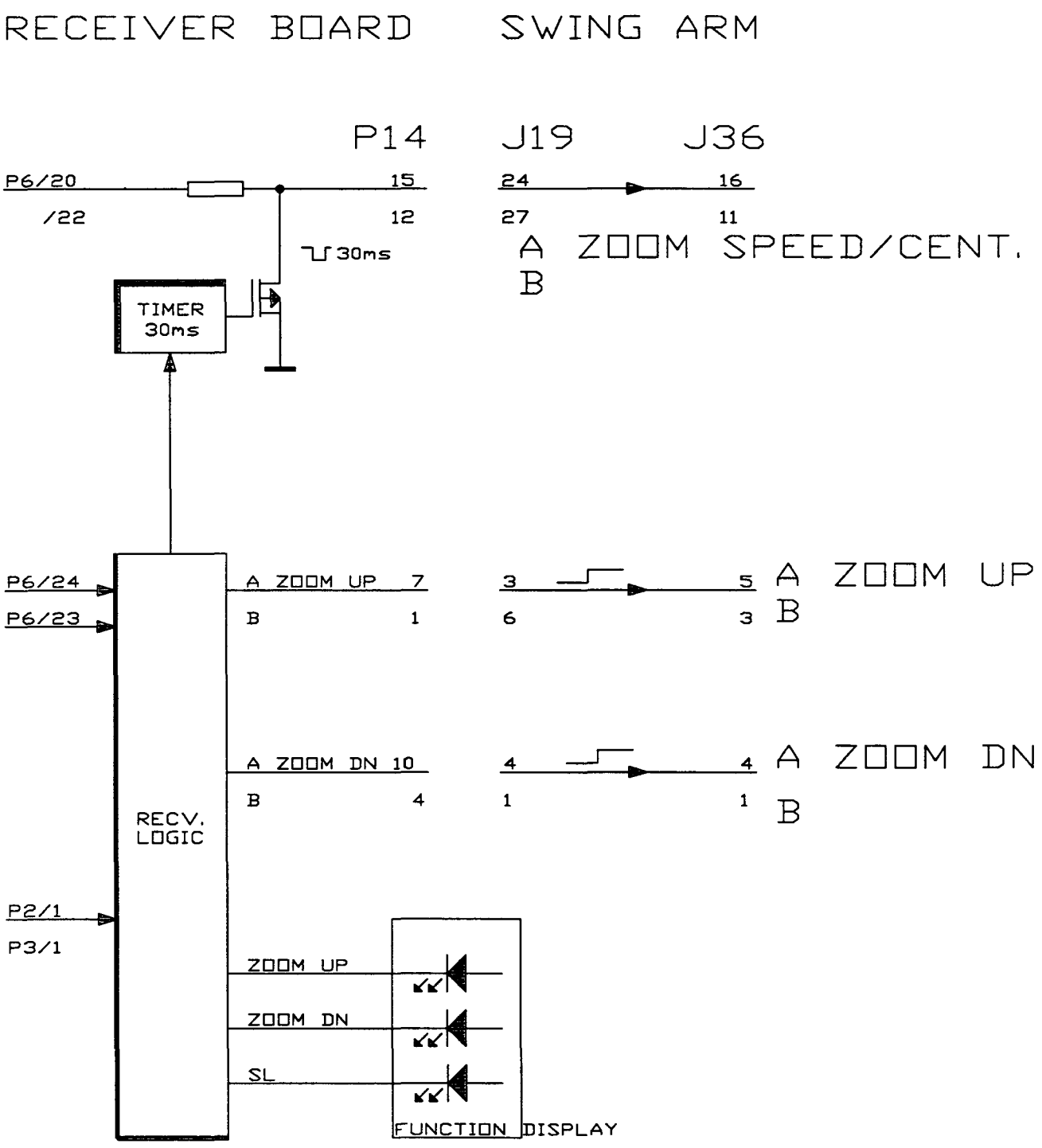
Tasks	Control elements / display	Page
Using motor to set and display zoom position:	Footswitch or handswitch Function display Up/down-LED on zoom servo	5-14, 7-10
Presetting zoom adjustment speed	Zoom speed potentiometer	5-14, 7-10
Setting zoom position 9 after switching on or resetting	Footswitch or handswitch Reset switch Z Display of zoom position on microscope	5-15, 7-11
Microscope A, B: Master-Slave Arranges and displays master function	Footswitch or handswitch A Reset switch Z LED on microscope	5-15, 7-11
Microscope A and B, changing sides: Exchanging the footswitch/handswitch functions	Selector switch on control unit	5-15
Producing signal level MAGN The focusing- and XY-speeds depend on the zoom position set.		5-15, 7-12





SELECTOR SWITCH




RECEIVER BOARD
SWING ARM
P14
J19
J36
P6/20
/22
15
12
24
27
16
11
A ZOOM SPEED/CENT.
B
30ms
TIMER
30ms
P6/24
P6/23
A ZOOM UP 7
B 1
3
6
5
3
A ZOOM UP
B
A ZOOM DN 10
B 4
4
1
4
1
A ZOOM DN
B
RECV.
LOGIC
P2/1
P3/1
ZOOM UP
ZOOM DN
SL
FUNCTION DISPLAY

Control LEDs

The function display tells you whether the signals from the footswitch or handswitch are being correctly received and interpreted:

Z↑ for ZOOM UP
Z↓ for ZOOM DOWN
SL← for CENTER POSITION

Using the motor to set the zoom position

The handswitch or the footswitch transmits on RD_2 or RD_3 the codes which correspond to the functions:

Data format:

ASCII 8-bit with start bit
repeating at 2.3-millisecond intervals
+5V/-8V

The logics on the receiver board (processor) assign the codes received to their appropriate functions:

ZOOM UP
ZOOM DOWN
CENTER POSITION ⇨ zoom position 9

The control signals (0V/5V) for ZOOM UP and ZOOM DOWN reach the logics board in the microscope via the swingarm cable.

Presetting the zoom displacement speed

The voltage level of ZOOM SPEED depends on the position of the potentiometer on the panel board. The displacement speeds of microscopes A and B are set separately, with one potentiometer for each microscope.

	Level of ZOOM SPEED
min. ZOOM SPEED	2.10V +- 0.25V
max. ZOOM SPEED	5V +- 5%

Setting zoom position 9

This function can only be triggered from the handswitch or footswitch A (selector switch on position 1), using the key (SL←). A timer sets A ZOOM SPEED to GND potential for about 30 milliseconds, using a transistor.

The impulse is recognized on the logics board in the M680 microscope and the system is steered to zoom position 9.

Microscope A, B: Master-Slave arrangement

Activation of SL← on the handswitch or footswitch A changes the assignment of the master function:

Press once: Master = A

Press twice: Master = B

The zoom of the slave microscope follows that of the master

Microscope A and B; Changing sides

This function assigns the ZOOM UP/DOWN movement of the handswitch or footswitch A to microscope B, and vice versa.

The position of the selector switch (1/2) on the panel board enables the receiver logics to recognize the assignment required for the handswitch or footswitch. In setting "2", an UP command is transmitted from the handswitch A to B ZOOM DOWN, and a DOWN command is transmitted to B ZOOM UP.

The commands from the handswitch or footswitch B are transmitted in a similar manner.

Producing the signal level MAGN

The microscope produces the signal level MAGN, the magnitude of which depends on the zoom position selected.

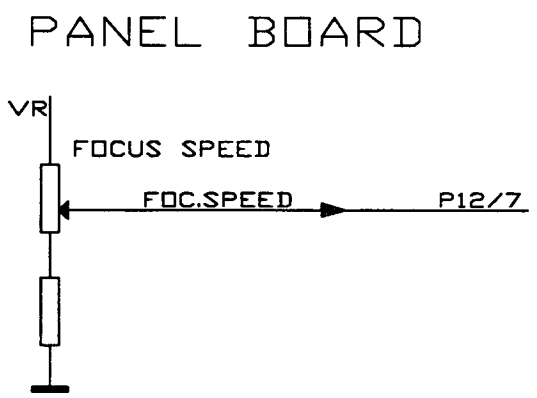
The following parameters are influenced:

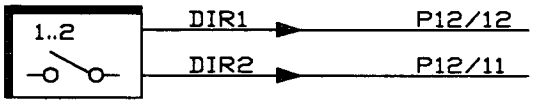
Focusing speed	see page 7-16
XY-speed	see page 5-27

Notes

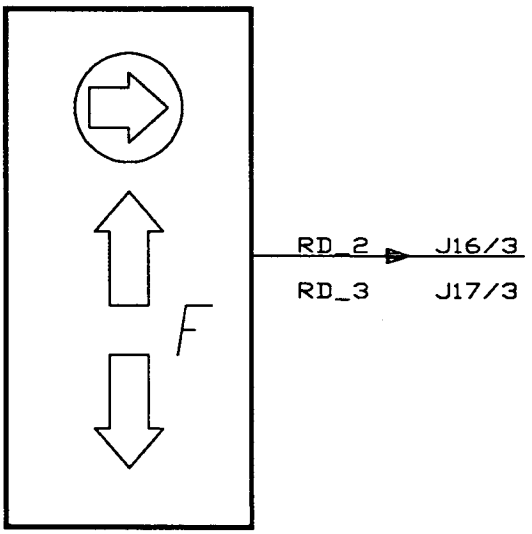
Focus control MEL61/62

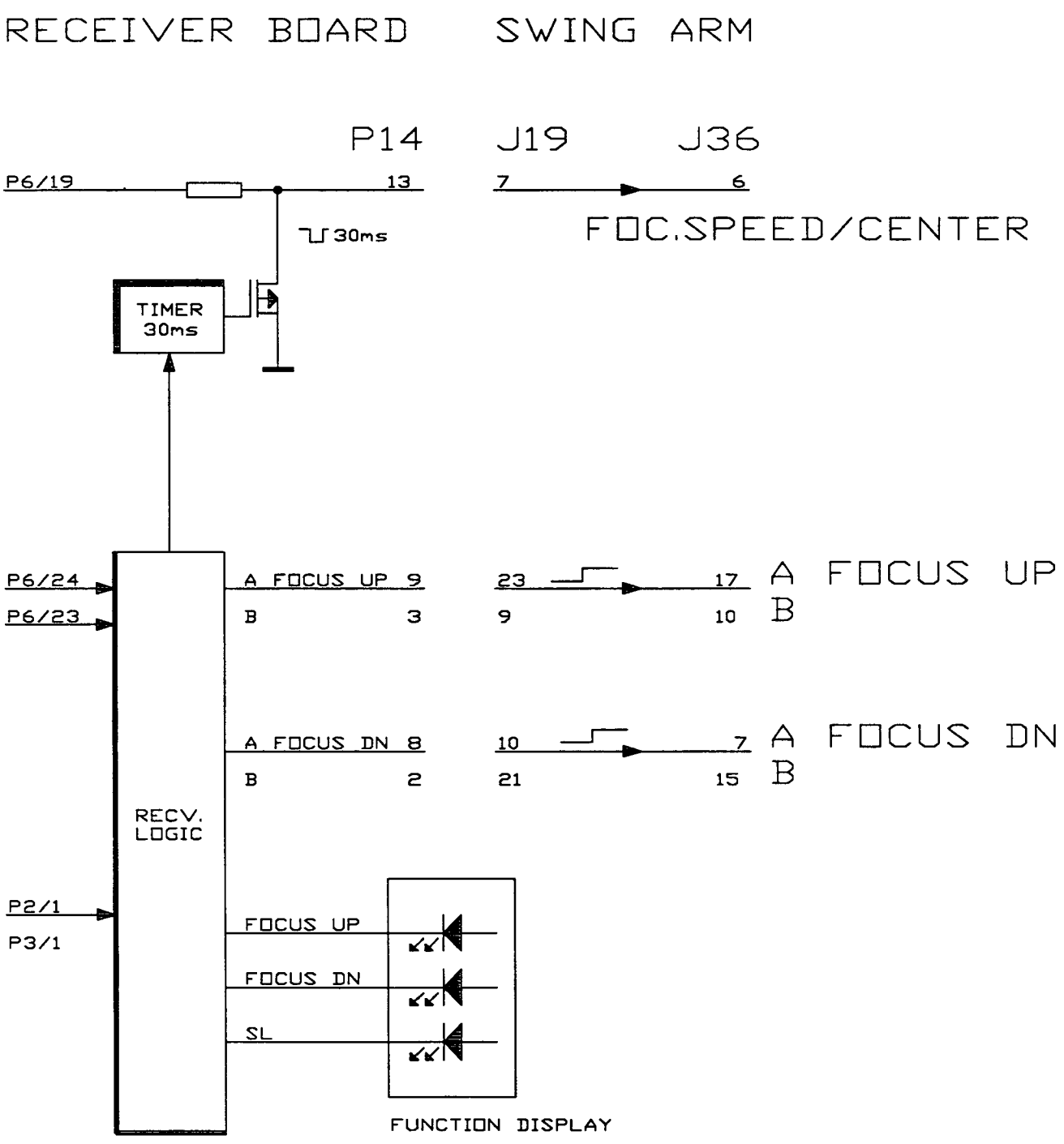
Tasks	Control elements/display	Pages
Motorized focusing	Footswitch or handswitch Function display	5-20, 7-16
Presetting speed of focusing	Focus speed potentiometer Zoom magnification	5-20, 7-16
Travelling to centre position after switching on or resetting	Footswitch or handswitch Reset switch F on microscope (light barrier)	5-21, 7-16
Microscope A and B, changing sides: Exchanging the functions of footswitch or handswitch	Selector switch on control unit	5-21





SELECTOR SWITCH




RECEIVER BOARD
SWING ARM
P14
J19
J36
P6/19
13
7
6
FOC.SPEED/CENTER
30ms
TIMER
30ms
P6/24
P6/23
A FOCUS UP 9
B 3
23
17
9
10
A
B
A FOCUS UP
A FOCUS DN 8
B 2
10
7
21
15
A FOCUS DN
RECV.
LOGIC
P2/1
P3/1
FOCUS UP
FOCUS DN
SL
FUNCTION DISPLAY

Control LEDs

The function display tells you whether the signals from the footswitch or handswitch are being correctly received and interpreted:

F↑ for FOCUS UP
F↓ for FOCUS DOWN
SL→ for CENTER POSITION

Motorized focusing

The handswitch or footswitch transmits on RD_2 or RD-3 the codes which correspond to the functions:

Data format:

ASCII 8-bit with start bit
repeating at 2.3-millisecond intervals
+5V/-8V

The logics on the receiver board (processor) assign the received codes to their appropriate functions:

FOCUS UP
FOCUS DOWN
CENTER POSITION

The control signals (0V/5V) for FOCUS UP and FOCUS DOWN reach the logics board in the microscope via the swingarm cable.

Presetting the focusing displacement speed

The voltage level of FOCUS SPEED depends on the setting of the potentiometer on the panel board. The displacement speeds of microscopes A and B are set at the same time.

	min. FOCUS SPEED	*max. FOCUS SPEED*
Zoom position 25	0.5V - 0.7V	2.1V +-5%
Zoom position <8	1.25V - 1.7V	5V +-5%

Travelling to mid-position

This function is activated from the handswitches or footswitches A and B, using the key (SL→), for the appropriate microscope. A timer (Monoflop) sets FOCUS SPEED to GND potential for about 30 milliseconds, using a transistor.

The impulse is recognized on the logics board in the M680 microscope, and the system is steered to the mid-position.

Microscope A and B, changing sides

This function assigns FOCUS UP/DOWN from the handswitch or footswitch A to the microscope B, and vice versa.

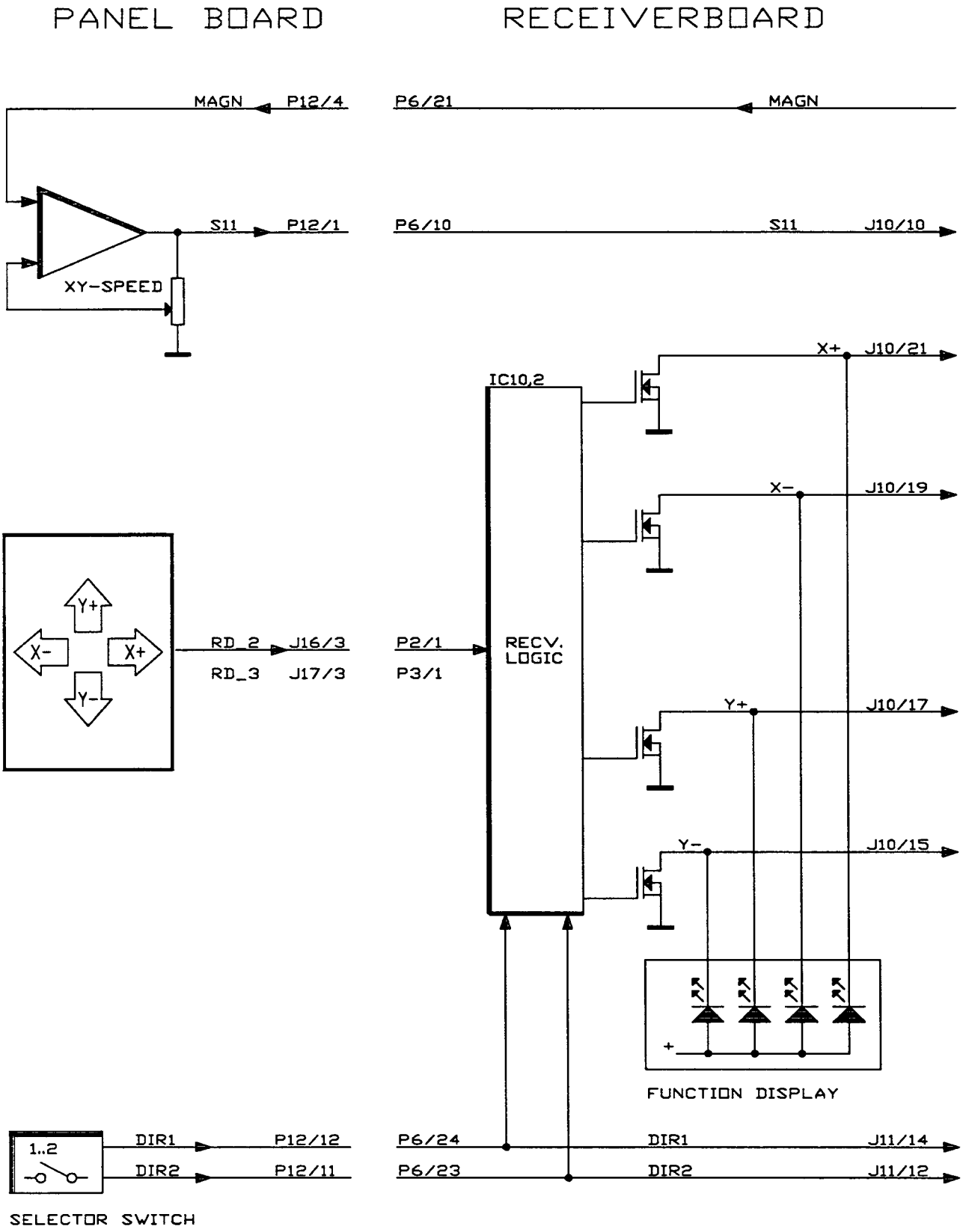
The position of the selector switch (1/2) on the panel board enables the receiver logics to recognize the assignment required for the handswitch or footswitch. In setting "2", an UP command from the handswitch A is transmitted from transmitted from the handswitch A to B FOCUS UP, and a DOWN command is transmitted to B FOCUS DOWN.

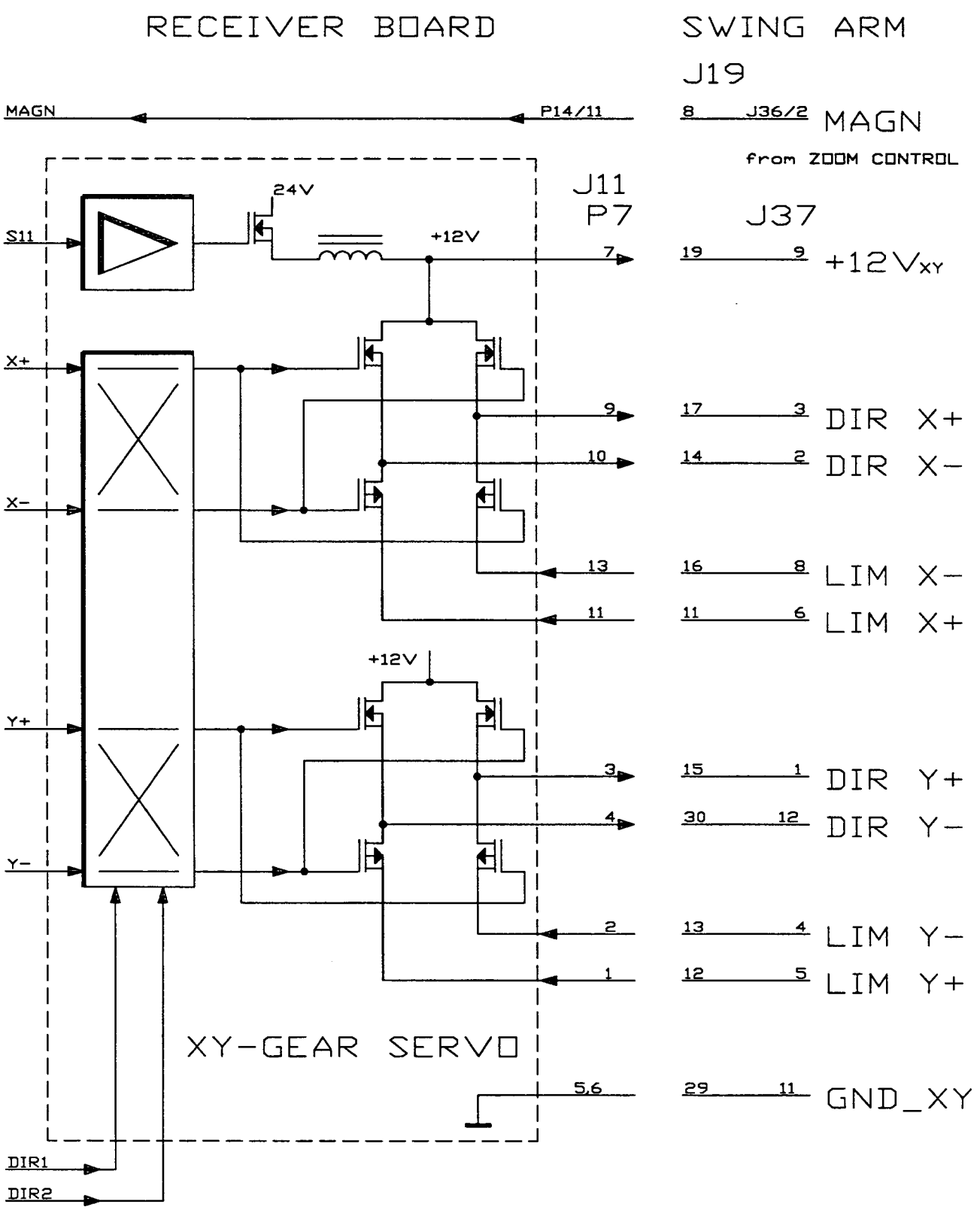
The commands from the handswitch or footswitch B are transmitted in a similar manner.

Notes

XY-gear control MEL61/62

Tasks	Control elements / display	Pages
Using motor to displace microscope	Footswitch or handswitch A or B Function display	5-26, 8-2
Recognising end of range	Light barriers in XY-gearbox	5-27, 8-2
Presetting the displacement speed	XY-speed potentiometer Zoom position: Signal level MAGN	5-27
Assigning functions of handswitch and footswitch to microscope A or B	Selector switch on control unit	5-27


PANEL BOARD
RECEIVERBOARD
MAGN
P12/4
P6/21
MAGN
S11
P12/1
P6/10
S11
J10/10
XY-SPEED
X+
J10/21
IC10,2
X-
J10/19
Y+
X-
X+
Y-
RD_2
J16/3
RD_3
J17/3
P2/1
P3/1
RECV.
LOGIC
Y+
J10/17
Y-
J10/15
+
FUNCTION DISPLAY
1..2
DIR1
P12/12
DIR2
P12/11
P6/24
DIR1
J11/14
P6/23
DIR2
J11/12
SELECTOR SWITCH


RECEIVER BOARD
SWING ARM
J19
MAGN
P14/11
8 J36/2 MAGN
from ZOOM CONTROL
J11
P7
J37
24V
S11
+12V
7
19 9 +12VXY
X+
9
17 3 DIR X+
X-
10
14 2 DIR X-
13
16 8 LIM X-
11
11 6 LIM X+
+12V
Y+
3
15 1 DIR Y+
Y-
4
30 12 DIR Y-
2
13 4 LIM Y-
1
12 5 LIM Y+
XY-GEAR SERVO
5,6
29 11 GND_XY
DIR1
DIR2

Control LEDs

The function display tells you whether the signals from the footswitch or handswitch are being correctly received and interpreted:

X→ for direction X+
X← for direction X-
Y↑ for direction Y+
Y↓ for direction Y-

Using the motor to displace the microscope

The handswitch or footswitch transmits on RD_2 or RD_3 the codes which correspond to the functions:

Data format:

ASCII 8-bit with start bit
repeating at 2.3-millisecond intervals
+5V/-8V

The logics on the receiver board (processor) assign the received codes to their appropriate functions:

X-direction →:	X+	DIR X+
X-direction ←:	X-	DIR X-
Y-direction ↑:	Y+	DIR Y+
Y-direction↓:	Y-	DIR Y-

The control signals X+/- and Y+/- reach the final stages on the servo board via the CMOS analog switch (IC10, 2). The final-stage transistors are switched in accordance with the direction of the required movement.

Current flows to the motor through DIR X(Y)+ and DIR X(Y)-, and to GND_XY through LIM X(Y)+ or LIM X(Y)-.

Recognizing the end of the range

When the XY-gear is active and the end of the range is reached, the motor current for the appropriate direction of movement is interrupted. The motor current flows through LIM X+(Y+) or LIM X-(Y-), depending on the sense of the rotation.

Presetting the displacement speed

The signal S11 from the panel board serves as a reference for the switching regulator on the servo board. It produces the supply voltage for the X- and Y-motors. S11 is influenced by:

XY-speed potentiometer

Signal MAGN (zoom position)

The level of MAGN depends on the zoom position; a low zoom setting permits a higher displacement speed.

Assigning the functions of handswitch and footswitch

When the sides are exchanged (= rotation of microscope by 180°), the handswitch or footswitch itself remains with the user, and so the selector switch on the panel board is not permitted to influence the sense of movement.

The sense of movement on the receiver board does however undergo a change, and this is indicated on the function display. The signals DIR1 and DIR2 control an array of CMOS analog switches on the servo board, and these cancel the reversal in the sense of movement.

Notes

Table of content

List of signals for swingarm MSV136/137

Chapter	Page
Power supply	6-1
Microscope control	6-3
XY-gear	6-5

List of signals for swingarm MSV 136/137

Required values for standard two-metre swingarm cable

- Unless otherwise indicated, set the lamp to minimum brightness, because the values quoted are only valid under these conditions.

Power supply

SIGNAL	*CONDITIONS*	*VALUE*	*TOL.*
24V$_{MICROSCOPE}$	Voltage against PGND Lamp min. brightness →	26V	+-5%
	Voltage against PGND Lamp max. brightness →	20V	+-5%
24V$_{XY-GEAR}$	Voltage against GND_XY Lamp min. brightness →	26V	
	Lamp max. brightness →	22V	+-5%
	X and Y activated together Tilted position = 30		
	Min. zoom position, max.speed →25V+-5%		
12V$_{XY-GEAR}$	Voltage against GND_XY Max. zoom position, min. speed →	5.2V	+-0.3V
	Max. zoom position, max. speed →	8.5V	+-0.5V
	Min. zoom position, min. speed →	9V	+-0.3V
	Min. zoom position, max. speed →	14.5V	+-0.6V

PGND	Voltage against SENSE Lamp min. brightness →	-50mV	
	Voltage against SENSE Lamp max. brightness →	-250mV	
	Voltage drop against logics level Lamp min. brightness: → (Test box: Microscope Setting: Focus up)	4.9V	-0.2V
	Voltage drop against logics level Lamp max. brightness → (Test box: Microscope Setting: Focus up)	4.2V	-0.8V
Current consumption Microscope	Lamp min. brightness → Quick-change lamp mount disengaged →	150mA 50mA	
	Lamp max. brightness Guiding value →	3.5A	
Current consumption XY-gear	not under load (X or Y) →	0.3A	
Current consumption XY-Gear	X and Y activated simultaneously Tilted position = 30° for X and Y Min. zoom position, max. speed → Restricted by hand →	0.7A max. 1.4A	

Microscope control

All signals are measured against SENSE

Unless otherwise indicated, set the lamp to minimum brightness

SIGNAL	*CONDITIONS*	*VALUE*	*TOL.*
LAMP REF	Lamp min./max. brightness	0.3 ... 5V	+-5%
MAGNIFICATION	min. zoom position → max. zoom position →	0.0V 4.0V	 +0.5V
FOCUS SPEED	Min./Max.	1.25 ... 1.7V / 5V	+-5%
A FOCUS UP **B FOCUS UP**	Low/High	<0.2V / >4.75V	
A FOCUS DN **B FOCUS DN**	Low/High	<0.2V / >4.75V	
A ZOOM SPEED **B ZOOM SPEED**	min./max.	1.84 ... 2.34V / 5V	+-5%

A ZOOM UP		
B ZOOM UP	Low/High	<0.2V / >4.75V
A ZOOM DN		
B ZOOM DN	Low/High	<0.2V / >4.75V

XY-gear

All voltages are measured against GND_XY

Signal	*Conditions*	*Value*	*Tol.*
DIRECTION X-	Zoom position 25: Speed min./max. → Zoom position 5: Speed min./max. →	>5V / <10V >9V / <16V	
LIMIT X-	At Speed max. →	7.9V	
DIRECTION X+	Zoom position 25: Speed min./max. → Zoom position 5: Speed min./max. →	>5V / <10V >9V / <16V	
LIMIT X+	At Speed max. →	7.9V	

DIRECTION Y-	Zoom position 25: Speed min./max. →	>5V / <10V
	Zoom position 5: Speed min./max. →	>9V / <16V
LIMIT Y-	At Speed max. →	7.9V
DIRECTION Y+	Zoom position 25: Speed min./max. →	>5V / <10V
	Zoom position 5: Speed min./max. →	>9V / <16V
LIMIT Y+	At Speed max. →	7.9V

Table of content

Description of functions
M680 microscope

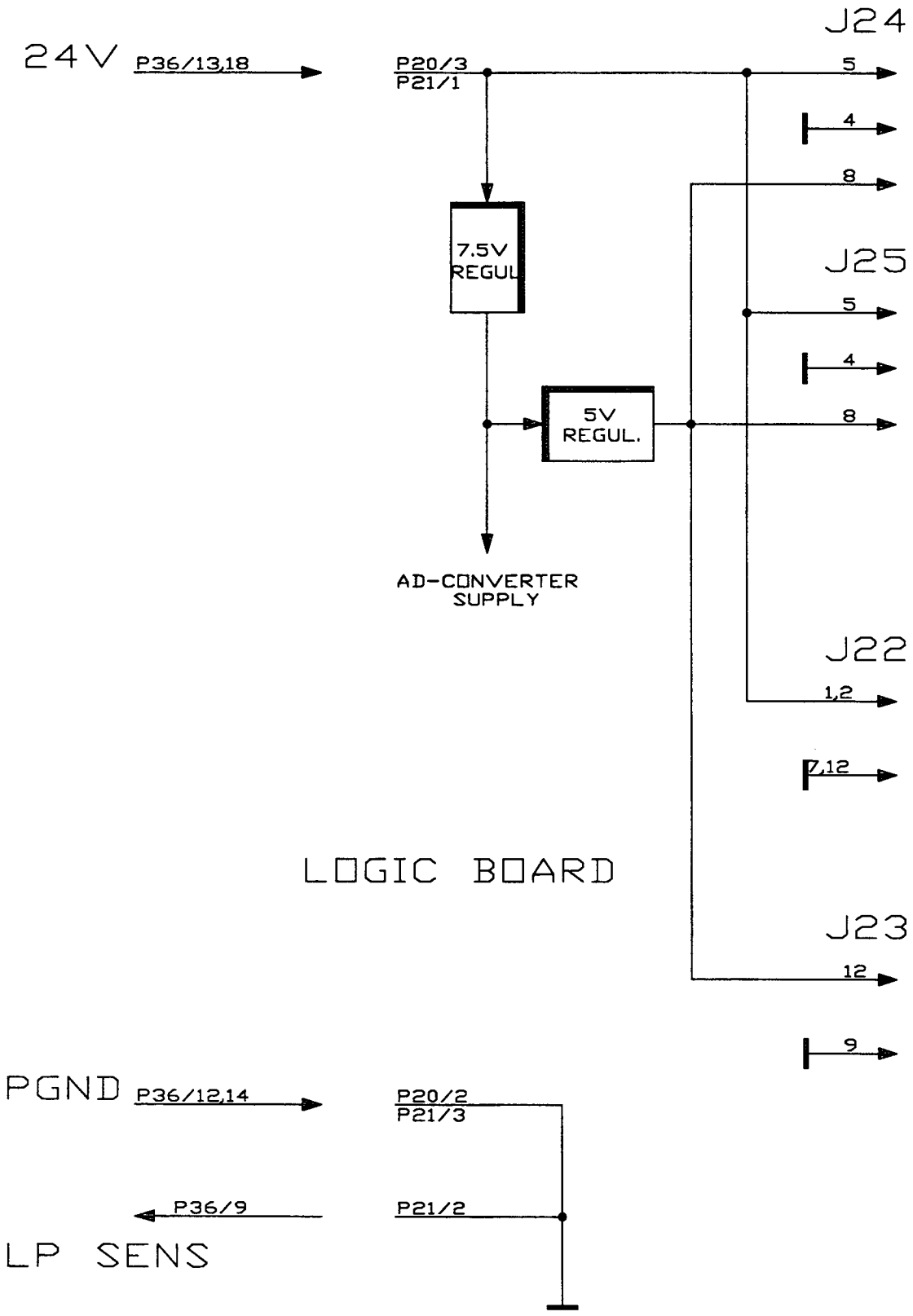
Chapter	Page
Power supply	7-1
Lamp control	7-5
Zoom control	7-7
Focus control	7-13

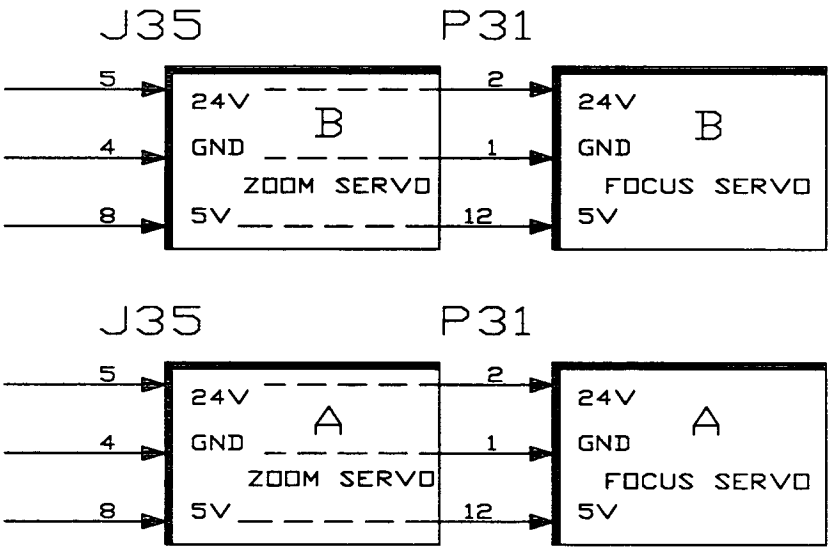
Power Supply

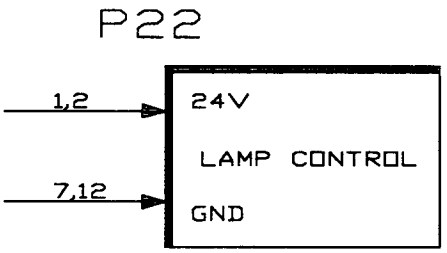
M680 microscope

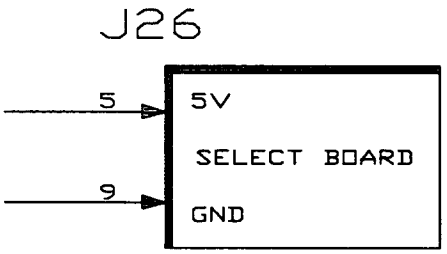
For functions of control unit, refer to page 5-3

Tasks	Page
24V-Supply	7-4
5V-Supply	7-4
Ground PGND, SENS	7-4


24V
P36/13,18
P20/3
P21/1
J24
5
4
8
7.5V
REGUL
J25
5
4
5V
REGUL.
8
AD-CONVERTER
SUPPLY
J22
1,2
7,12
LOGIC BOARD
J23
12
9
PGND
P36/12,14
P20/2
P21/3
P36/9
P21/2
LP SENS


J35
P31
5
4
8
24V
GND
5V
B
ZOOM SERVO
2
1
12
24V
GND
5V
B
FOCUS SERVO
J35
P31
5
4
8
24V
GND
5V
A
ZOOM SERVO
2
1
12
24V
GND
5V
A
FOCUS SERVO


P22
1,2
7,12
24V
LAMP CONTROL
GND


J26
5
9
5V
SELECT BOARD
GND

24V supply

Through the logics board, the ...

Zoom Servos A + B
Focus Servos A + B and
Lamp Control

... are supplied with 24V.

The final stage for the lamp, and for the pairs of zoom- and focusing motors, is supplied with 24V through these boards, via a switching regulator.

5V supply on logics board

Supplies: Logics board
Zoom Servos
Focus Servos

A switching regulator uses the 24V source to supply 7.5V to the AD converter for focus- and zoom control. A regulator reduces this to 5V.

PGND, SENS and Logics-Ground

Microscope-Ground (PGND) and SENS are linked within the microscope. The high lamp current causes a voltage drop of about 0.6V to PGND. This voltage is passed to the control unit through SENS.

Situation up until July 1993 ...

For the reason indicated above, Logics-Ground is about 0.6V below PGND in the microscope. The voltage drop at PGND affects the level of the control signals, and so longer swingarm cables than the standard ones can result in malfunctioning.

New situation as from August 1993

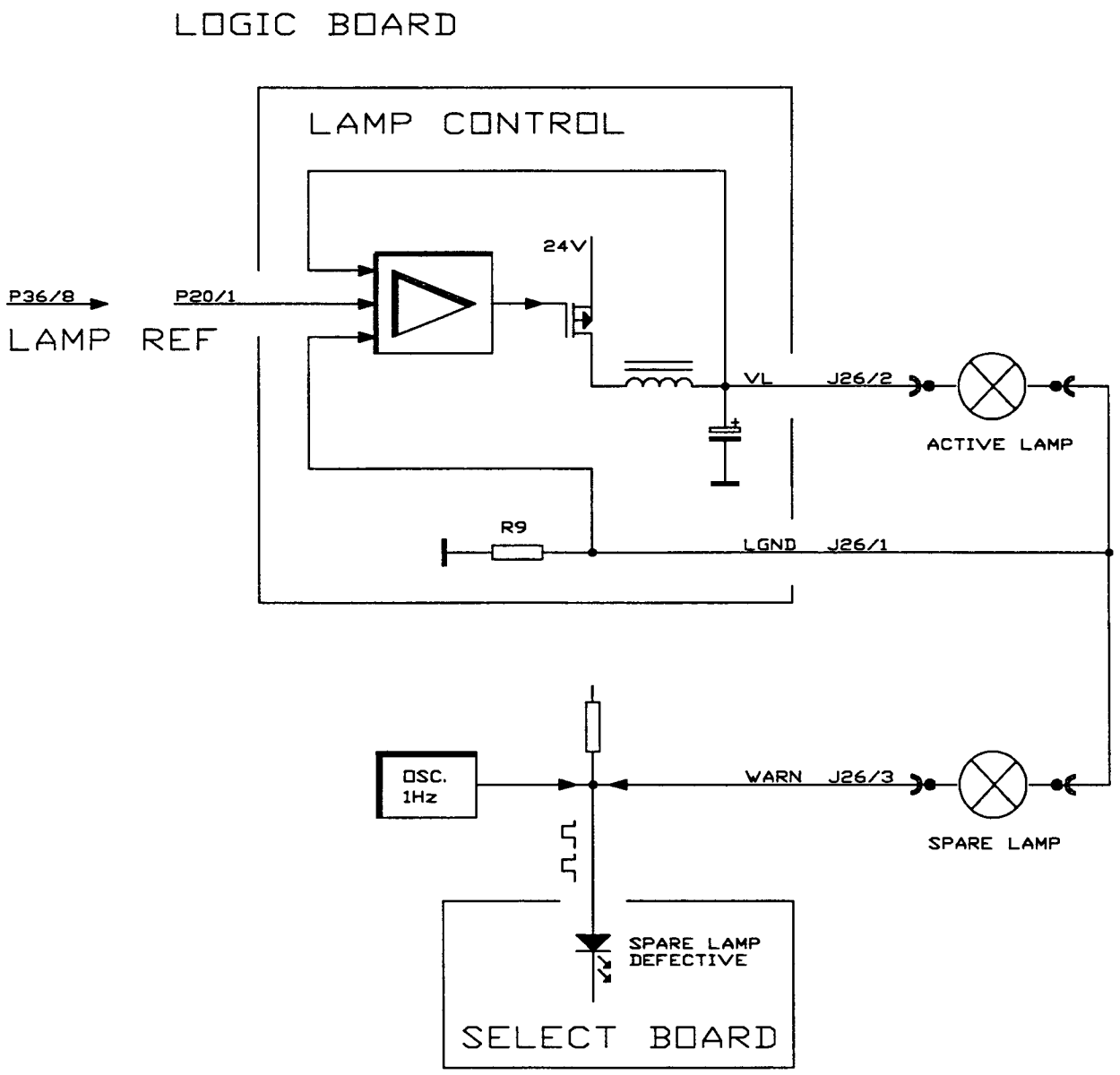
Logics-Ground in the control unit is connected to SENSE and so is partly dependent on PGND. The effect on the control signals is therefore less and longer swingarm cables can be used.

Lamp control

M680 microscope

For functions of control unit, refer to page 5-9

Tasks	Control elements / displays	Page
Setting the lamp brightness	Control unit	7-6
Limiting the excess current	Measuring resistor on LAMP CONTROL	7-6
Inspecting the spare bulb	LED (Halogen lamp symbol) flashes	7-6



Adjusting the lamp brightness

A pulse-width modulator, dependent on the level of LAMP REF, controls the final-stage transistors. The voltage is smoothed with chokes and electrolytic condensers and the electricity is conducted to the lamp across the logics board and slip-rings.

The secondary voltage is compared with the required value (LAMP REF) at the entrance of the regulator.

Limiting the excess current

The lamp current produces a voltage drop across resistor R9 in Lamp-Ground (LGND). The regulator measures this voltage drop and limits the current to 5A during the final stage.

Inspecting the spare bulb

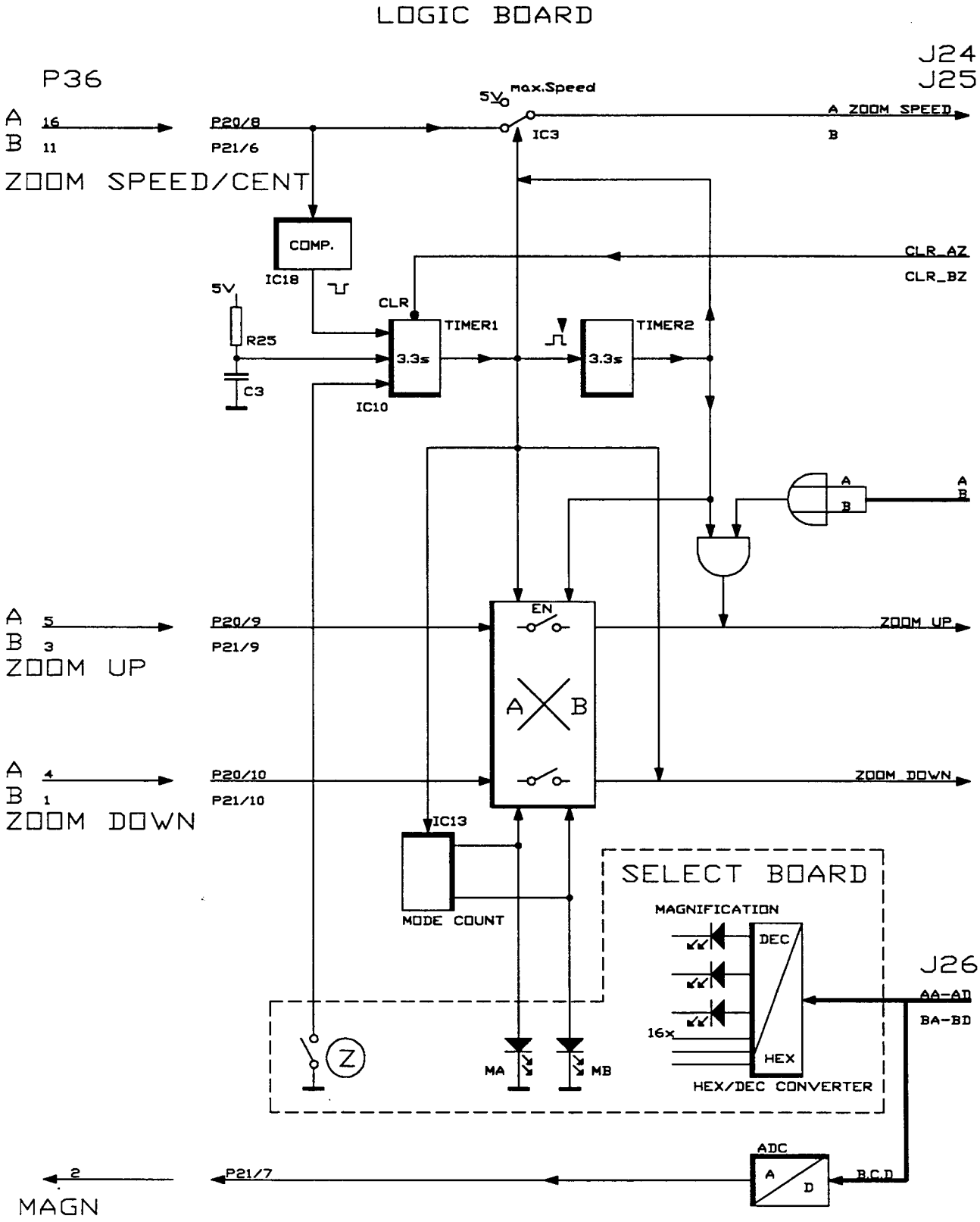
The WARN circuit passing through the spare bulb in the quick-change lamp mount is at GND potential. If the bulb is defective, or the quick-change lamp mount is disengaged, the outlet of the 1Hz oscillator on the logics board becomes vacant and the LED behind the halogen lamp symbol flashes.

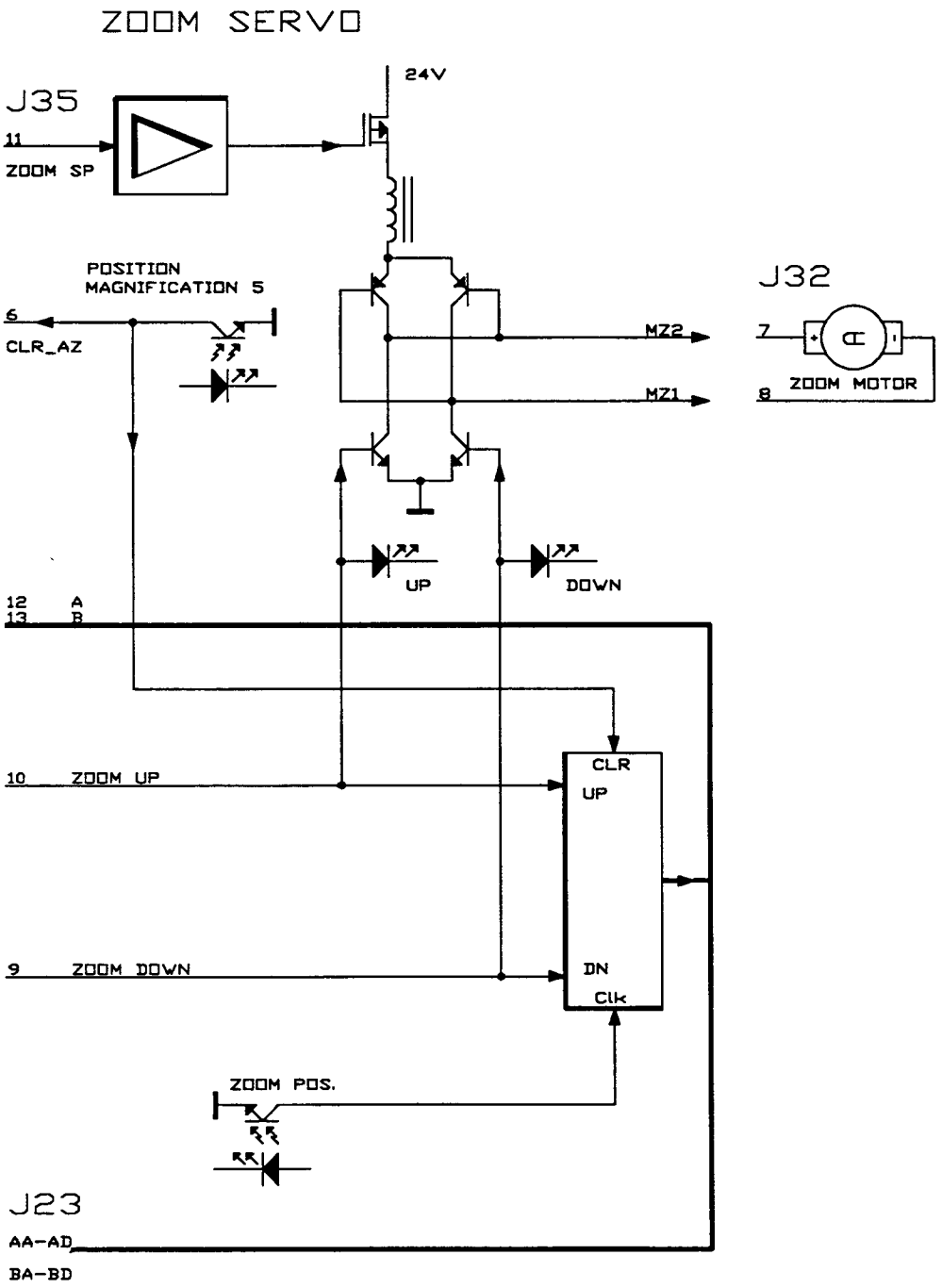
Zoom control

M680 microscope

For functions of control unit, refer to page 5-11

Tasks	Control elements / displays	Page
Setting zoom position with motor	LEDs: ZOOM UP + DOWN	7-10
Presetting zoom displacement speed	Control unit	7-10
Setting Zoom position 9	Reset switch Z Control unit	7-11
Microscope A, B **Master-slave arrangement**	Reset switch Z Control unit	7-11
Producing signal level MAGN	Zoom position	7-12


LOGIC BOARD
P36
J24
J25
A 16
B 11
ZOOM SPEED/CENT
P20/8
P21/6
5V
max.Speed
IC3
A ZOOM SPEED
B
COMP.
IC18
CLR_AZ
CLR_BZ
5V
R25
C3
CLR
TIMER1
3.3s
IC10
TIMER2
3.3s
A
B
A
B
A 5
B 3
ZOOM UP
P20/9
P21/9
EN
ZOOM UP
A 4
B 1
ZOOM DOWN
P20/10
P21/10
ZOOM DOWN
IC13
MODE COUNT
SELECT BOARD
MAGNIFICATION
DEC
16x
HEX
HEX/DEC CONVERTER
J26
AA-AD
BA-BD
Z
MA
MB
ADC
A
D
B.C.D
2
MAGN
P21/7


ZOOM SERVO
J35
11
ZOOM SP
24V
POSITION
MAGNIFICATION 5
6
CLR_AZ
J32
MZ2
MZ1
7
8
ZOOM MOTOR
UP
DOWN
12 A
13 B
10 ZOOM UP
9 ZOOM DOWN
CLR
UP
DN
Clk
ZOOM POS.
J23
AA-AD
BA-BD

Control LEDs

Yellow LEDs on the zoom servo board for the signals

ZOOM UP
ZOOM DOWN

Using motor to set zoom position ...

The control signals (0V/5V) for A/B ZOOM UP and A/B ZOOM DOWN reach the logics board in the microscope via the swingarm cable. By means of an array of tri-state drivers (IC2, 7), ZOOM UP/DOWN activates the final-stage transistors on the zoom servo board. The end-stage comprises a bridging circuit of transistors which are activated in accordance with the direction of displacement.

... and to display it

An encoder foil, with 15 bright/dark transitions, surrounds the zoom cam. The transitions are monitored by a light barrier when the motor activates the cam. A counter (IC3) records the impulses in the up or down direction. The direction of counting is reversed by the signals ZOOM UP and ZOOM DOWN.

A second light barrier monitors the end of the zoom range, and the counter is reset at the lowest zoom setting (5).

A hexadecimal-to-decimal decoder on the select board converts the four-bit zoom position (A, B, C, D) from the outlet of the counter. An array of 16 LEDs is activated.

Presetting the zoom displacement speed

The displacement speed is adjusted by means of the supply voltage for the zoom motor. The final stage only has a switching function. The ZOOM SPEED level is the reference for the voltage regulator on the zoom servo board. The no-load voltage (plug J32 not connected) at the outlet of the end stage is adjustable within the range 3.9V - 8.1V +-2%.

The regulator has a positive current feedback, and so the motor voltage increases with the load. The current through the final stage is limited to about 190mA.

Setting zoom position 9

The system is triggered by:

- Switching on the microscope (RC member R25, C3)
- Pressing key "Z" on select board
- 30-millisecond pulse to ZOOM SPEED from control unit. The comparator IC18 recognizes when ZOOM SPEED is set to GND potential.

The following functions are activated by the triggering:

1. Timer1 (IC10). ZOOM SPEED is set to 5V (=maximum); the lines ZOOM SPEED, ZOOM UP and DOWN are interrupted.
2. Timer1 activates ZOOM DOWN simultaneously. The motor drives the zoom towards position 5.
3. A light barrier detects the end of the range at zoom position 5 and cuts off the power for this sense of rotation. Timer 1 is reset (CLR) - with that the zoom display is synchronized to zoom position.
4. When Timer1 is reset, Timer2 (IC10) starts and activates ZOOM UP. The motor drives the zoom towards position 9.
5. Zoom position 9 corresponds to binary number 6 on the zoom position counter. When this position is reached, the two counter outlets A and B go to logic 1. ZOOM UP becomes inactive over gate IC16, 19, and the motor stops.

Microscope A, B: Master-Slave arrangement

The operational mode is changed by pressing the keys:

- "Z" on the select board, and
- "SL←" on the handswitch or footswitch

Whenever Timer1 is triggered on the logics board, an impulse is transmitted to the counter logics (IC13), which then accordingly re-route the signals A/B ZOOM UP and A/B ZOOM DOWN by means of an array of tri-state drivers, creating the following situations:

1. **Separate use of microscopes A and B:**
   The signals for ZOOM UP and DOWN proceed independently for Zoom Servo A and Zoom Servo B.

2. **Master = microscope A:**
   Both signal A ZOOM UP and signal A ZOOM DOWN are transmitted to the zoom servos A and B. The zoom position of Slave B is compared with that of Master A, and follows it.

3. **Master = microscope B:**
   Both signal B ZOOM UP and signal B ZOOMDOWN are transmitted to the zoom servos A and B. The zoom position of Slave A is compared with that of Master B, and follows it.

Producing the signal level MAGN

A D/A converter changes the ZOOM position (counter outlets B, C and D) into a voltage corresponding to the binary value. This voltage, in the form of the signal level MAGN, influences the XY-speed, which is reduced as the zoom position increases.

The signal MAGN is dependent on the operational mode of microscope A or B:

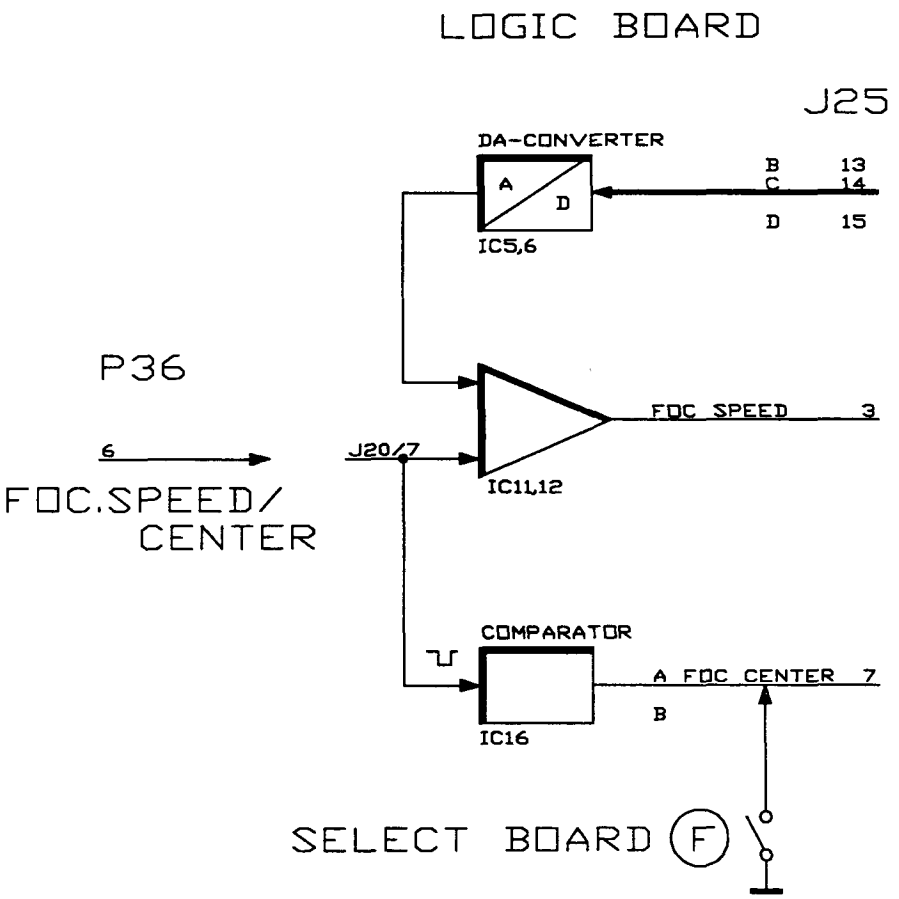
Mode	*MAGN is determined by*
Independent	Microscope A
Master = microscope A	
Master = microscope B	Microscope B

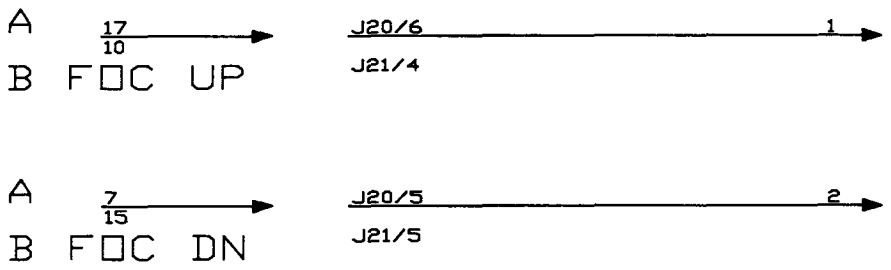
Focus control

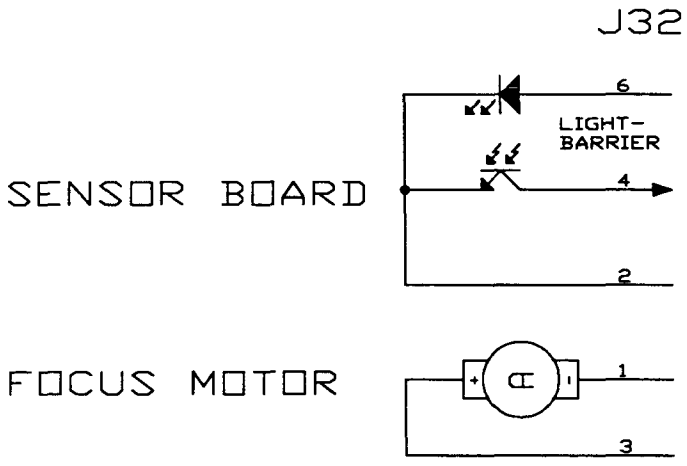
M680 microscope

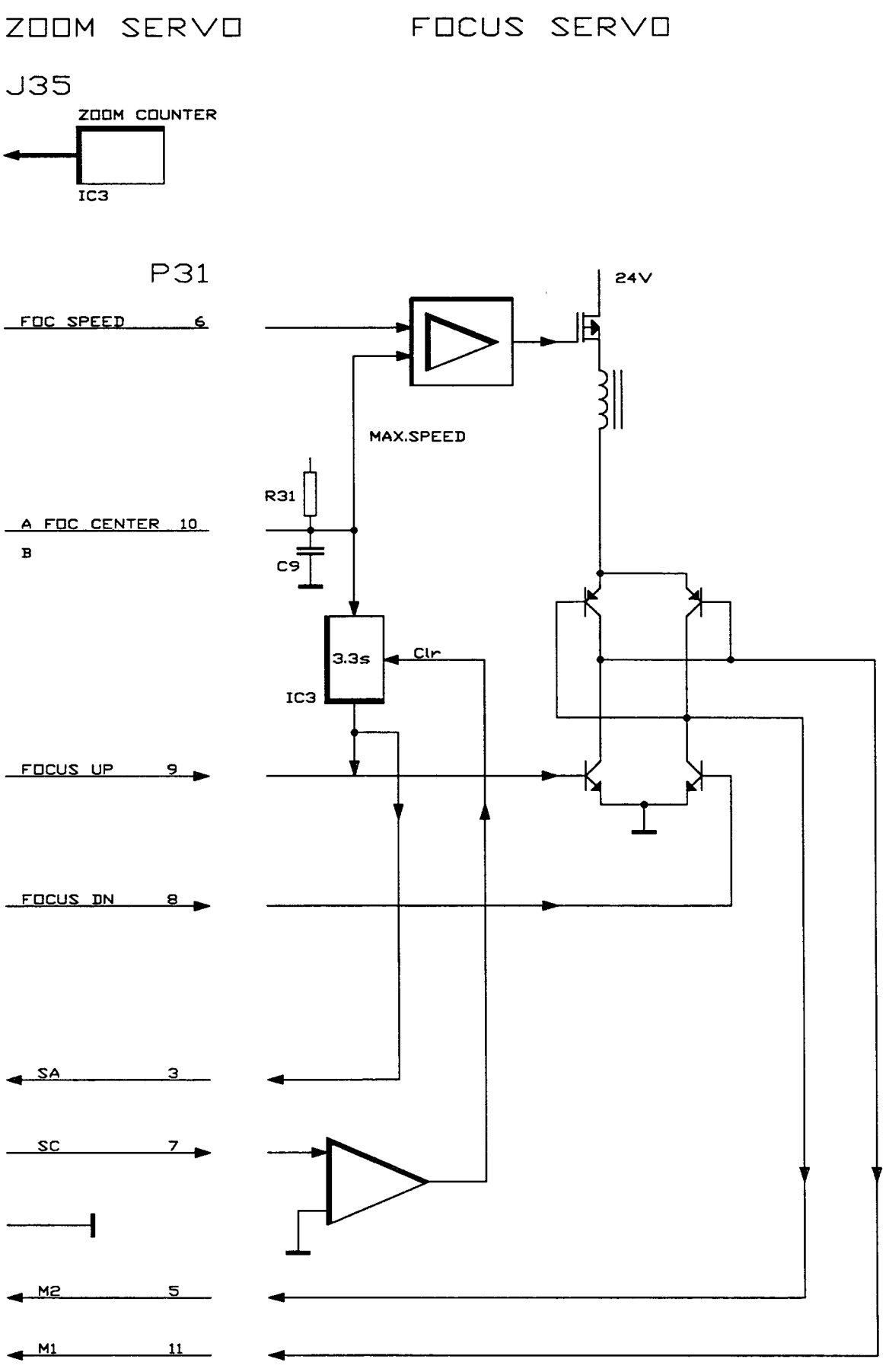
For functions of control unit, refer to page 5-17

Tasks	Control elements / displays	Page
Motorized focusing	Control unit	7-16
Presetting the focus displacement speed	Control unit	7-16
Travelling to the mid-point	Focus reset switch Control unit	7-16


LOGIC BOARD
J25
DA-CONVERTER
A
D
IC5,6
B 13
C 14
D 15
P36
6
FOC.SPEED/
CENTER
J20/7
IC11,12
FOC SPEED 3
COMPARATOR
IC16
A FOC CENTER 7
B
SELECT BOARD F


A
17
10
B FOC UP
J20/6
1
J21/4
A
7
15
B FOC DN
J20/5
2
J21/5


J32
SENSOR BOARD
6
LIGHT-
BARRIER
4
2
FOCUS MOTOR
1
3


ZOOM SERVO
FOCUS SERVO
J35
ZOOM COUNTER
IC3
P31
24V
FOC SPEED 6
MAX.SPEED
R31
A FOC CENTER 10
B
C9
3.3s
Clr
IC3
FOCUS UP 9
FOCUS DN 8
SA 3
SC 7
M2 5
M1 11

Motorized focusing

The control signals (0V/5V) for A/B FOCUS UP and A/B FOCUS DOWN pass through the swingarm cable and the logics board to reach Focus Servo A or B in the microscope. FOCUS UP/DOWN activates the end-stage transistors in the zoom servo board. The end-stage consists of a bridging circuit of transistors, and so the motor can drive the focusing mechanism in both senses of rotation.

Presetting the focus displacement speed

The displacement speed is altered with the supply voltage for the focus motors. The final stage only has a switching function. The FOCUS SPEED level is the reference for the voltage regulator on the focus servo board. The output of the zoom counter is converted to a DC-level affecting FOC SPEED. With that the displacement speed of focus is reduced at higher zoom magnification. The voltage is adjustable within the range:

	Motor voltage min. speed	Motor voltage max. speed
Zoom position 25	1.9V	4.35
Zoom position 5	3.3V	9.0V

The current through the final stage is limited to about 160mA.

Travelling to the mid-position

Triggered by:

- Switching on the microscope. RC member R31, C9 on focus servo board.
- Pressing key "F" on select board
- 30-microsecond pulse to FOCUS SPEED of control unit. The comparator IC16 recognizes when FOCUS SPEED is at GND potential.

The following functions are activated as a result:

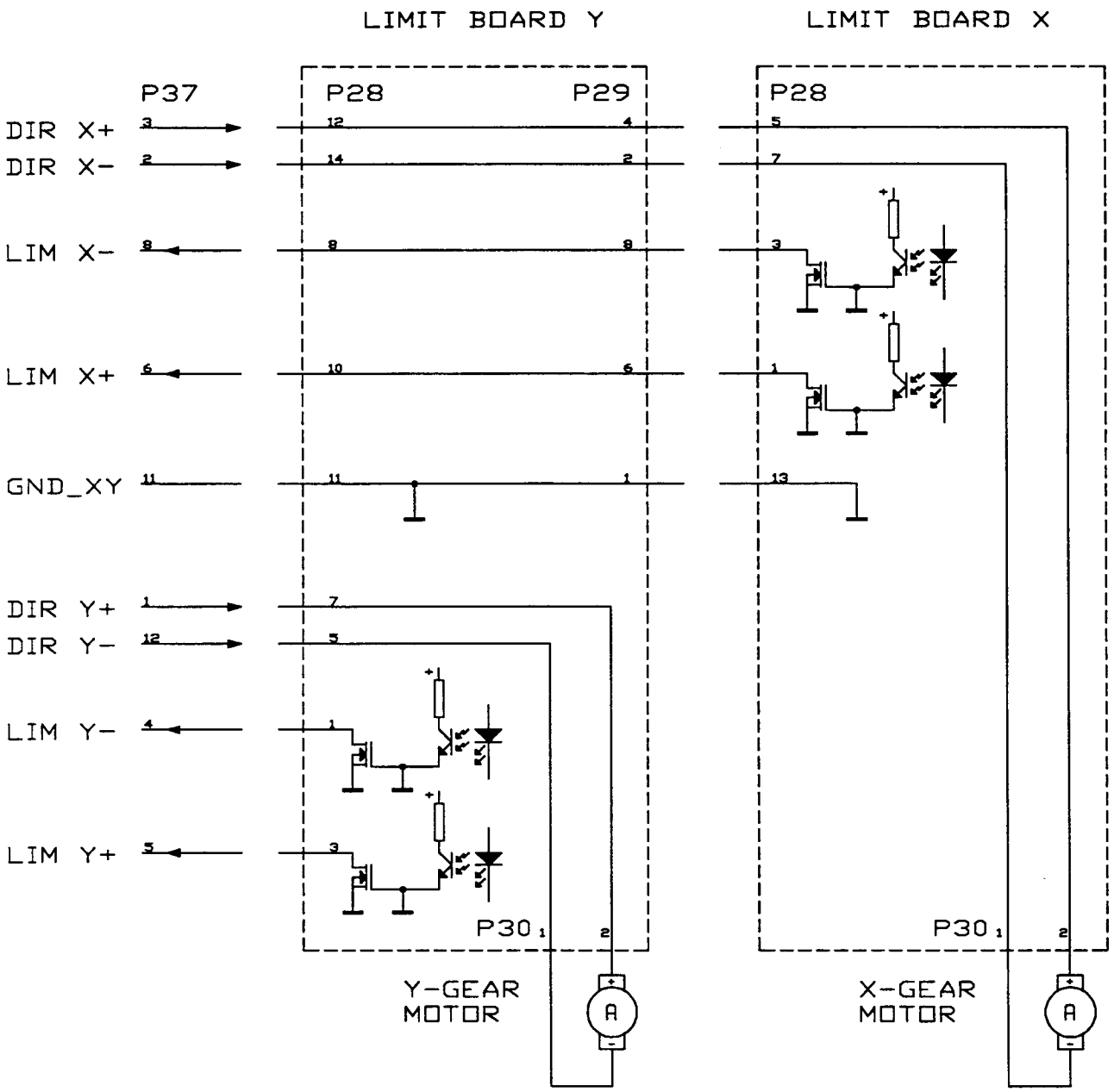
1. Timer (IC3) on focus servo is triggered, and governs the end stage in the direction FOCUS UP.
2. The voltage supplied to the focusing motor simultaneously switches the system to maximum speed. The motor moves the focusing mechanism in the direction FOCUS UP.
3. A light barrier on the sensor board detects the mid-position and resets the timer and therefore also the functions FOCUS UP and MAX.SPEED.

Control of XY-gear

M680 microscope

For functions of control unit, refer to page 5-23

Task	Control elements	Page
Motorized repositioning of microscope	Control unit	8-2
Recognizing end of range	Light barriers on LIMIT BOARD X and Y	8-2



Motorized repositioning of microscope

The end stage on the servo in the control unit governs the motor directly, using the signals DIR X(Y). The tilt ranges in the two directions are:

X: +-20°
Y: +-40°

Recognizing the end of the range

A light barrier in the X-gear, and one in the Y-gear, detect the end of a range. A FET then interrupts the motor current flowing through LIM X(Y) to GND_XY. In the opposite direction of rotation, the motor can move the gearing beyond the limit.

Referenz auf Steckverbinder
Reference to connectors

Wo im Instrument die Steckverbindungen zu finden sind erfahren Sie anhand dieser Liste und der nachfolgenden Seiten.

The location of connectors is shown by the list, referring to following pages.

Steckverb. Connector	Seite Page	Einheit Unit
P1	9-5, 6	Steuergerät - Control unit MEL61/62
JP2	9-6	Steuergerät - Control unit MEL61/62
JP3	9-6	Steuergerät - Control unit MEL61/62
JP6	9-6	Steuergerät - Control unit MEL61/62
JP7	9-6	Steuergerät - Control unit MEL61/62
JP8	9-6	Steuergerät - Control unit MEL61/62
JP9	9-6	Steuergerät - Control unit MEL61/62
JP10	9-6	Steuergerät - Control unit MEL61/62
JP11	9-6	Steuergerät - Control unit MEL61/62
JP12	9-7	Steuergerät - Control unit MEL61/62
JP14	9-6	Steuergerät - Control unit MEL61/62
J16	9-5, 6	Steuergerät - Control unit MEL61/62
J17	9-5, 6	Steuergerät - Control unit MEL61/62
JP18	9-7	Steuergerät - Control unit MEL61/62
J19	9-5, 6	Steuergerät - Control unit MEL61/62
P19	9-8	Schwenkarm - Swingarm MSV136/137
JP20	9-10	Mikroskop - Microscope M680

Steckverb. Connector	Seite Page	Einheit Unit
JP21	9-10	Mikroskop - Microscope M680
JP22	9-12	Mikroskop - Microscope M680
JP23	9-10	Mikroskop - Microscope M680
JP24	9-11	Mikroskop - Microscope M680
JP25	9-11	Mikroskop - Microscope M680
JP26	9-10	Mikroskop - Microscope M680
J27	9-5, 6	Steuergerät - Control unit MEL61/62
JP28	9-13, 14	Y-Gear and X-Gear MSV138
JP29	9-13	Y-Gear MSV138
JP30	9-13, 14	Y-Gear and X-Gear MSV138
JP31	9-12	Mikroskop A+B - Microscope A+B M680
JP32	9-12	Mikroskop A+B - Microscope A+B M680
JP35	9-12	Mikroskop A+B - Microscope A+B M680
J36	9-9	Schwenkarm - Swingarm MSV136/137
P36	9-10	Mikroskop - Microscope M680
J37	9-9	Schwenkarm - Swingarm MSV136/137
P37	9-13	Y-Gear MSV138
J38	9-13	Y-Gear MSV138
P38	9-15	X-Gear MSV138

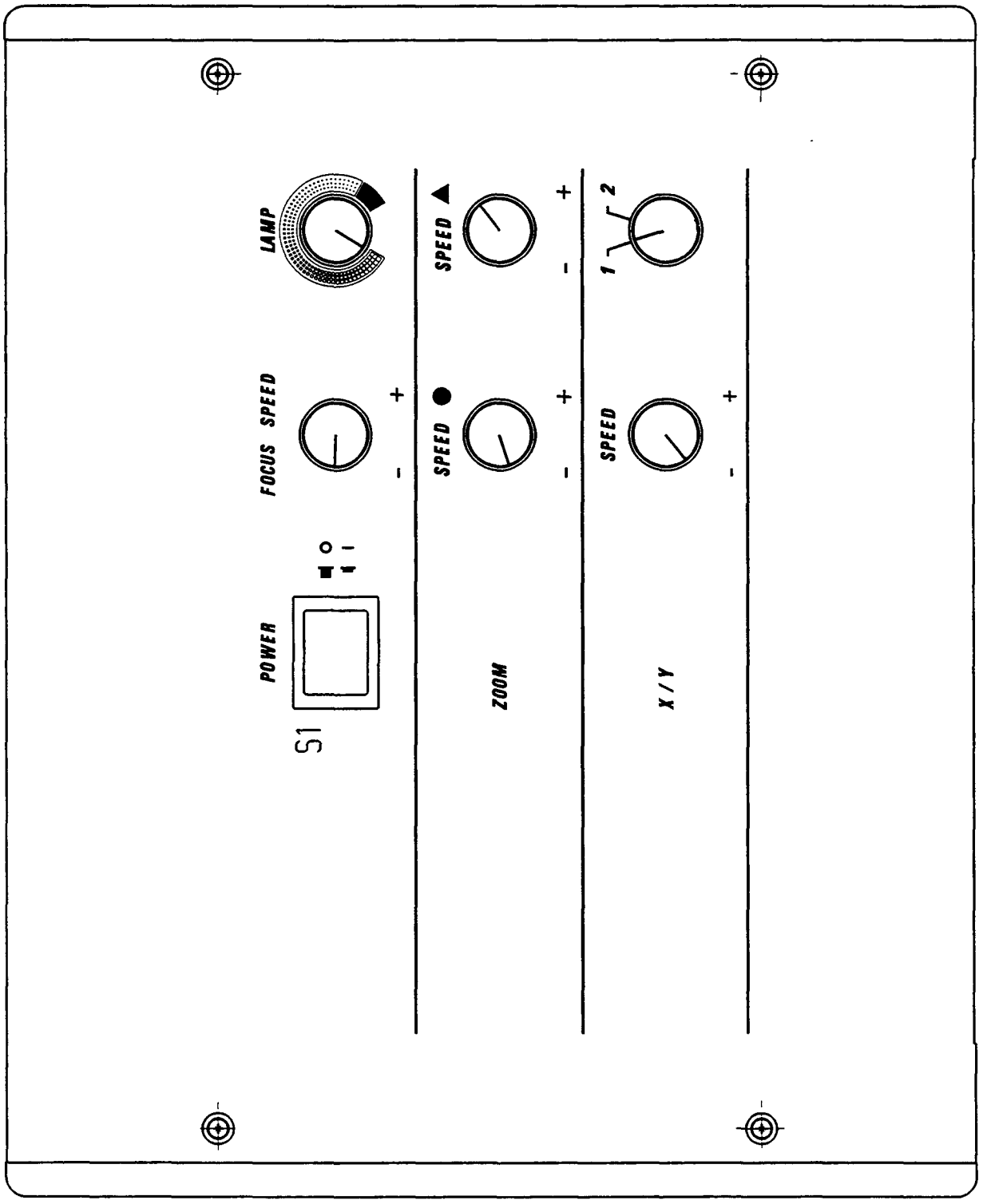
Referenz auf Boards
Reference to boards

Boards finden Sie anhand der Liste und der nachfolgenden Abbildungen.

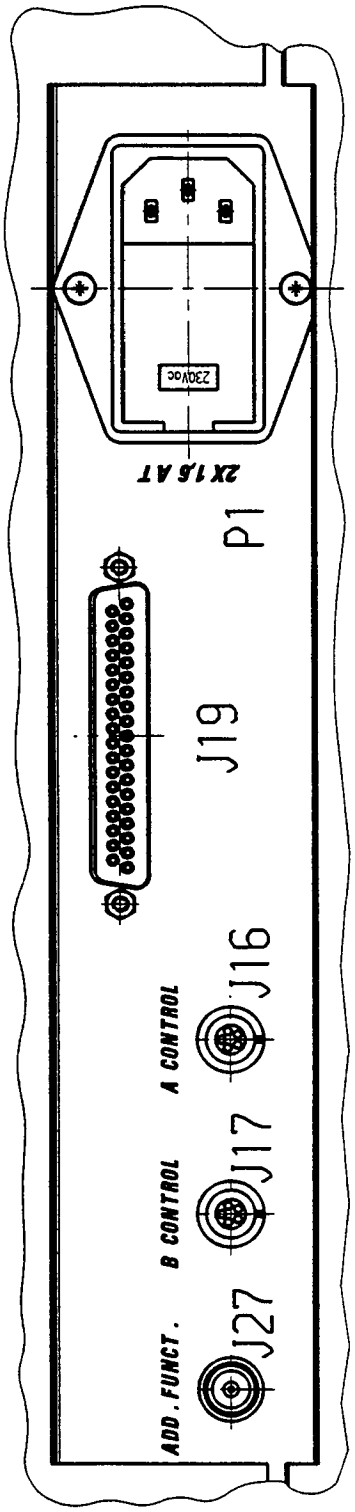
The location of boards is shown by the list, referring to following pages.

Board	Seite Page	Einheit Unit
Focus Servo A	9-12	Mikroskop A - Microscope A M680
Focus Servo B	9-12	Mikroskop B gegenüber A; gleiche Anordnung Microscope B opposit A; same allocation
Function Display	9-6	Steuergerät - Control unit MEL61/62
Lamp Control	9-10, 12	Mikroskop - Microscope M680
Limit Board	9-13, 14	X-Gear + Y-Gear MSV138
Logic Board	9-11, 12	Mikroskop - Microscope M680
Panel Board	9-7	Steuergerät - Control unit MEL61/62
Receiver Board	9-6	Steuergerät - Control unit MEL61/62
Select Board	9-10	Mikroskop - Microscope M680
Sensor Board	9-12	Mikroskop - Microscope M680
Servo (XY-Gear)	9-6	Steuergerät - Control unit MEL61/62
Zoom Servo A	9-12	Mikroskop A - Microscope A M680
Zoom Servo B	9-12	Mikroskop B gegenüber A; gleiche Anordnung Microscope B opposit A; same allocation

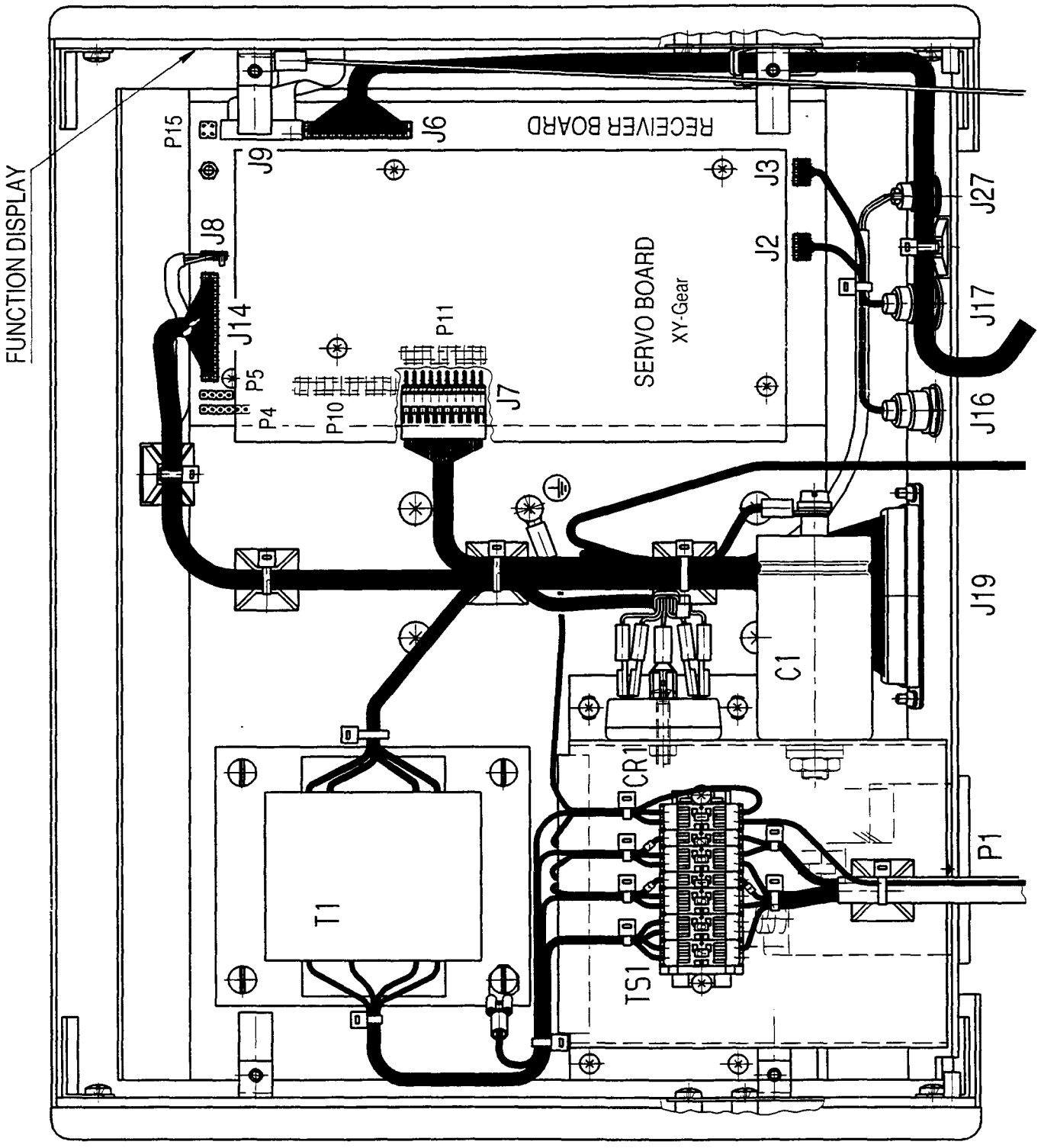
Steuergerät MEL61/62 - Frontplatte
Control unit MEL61/62 - Front plate



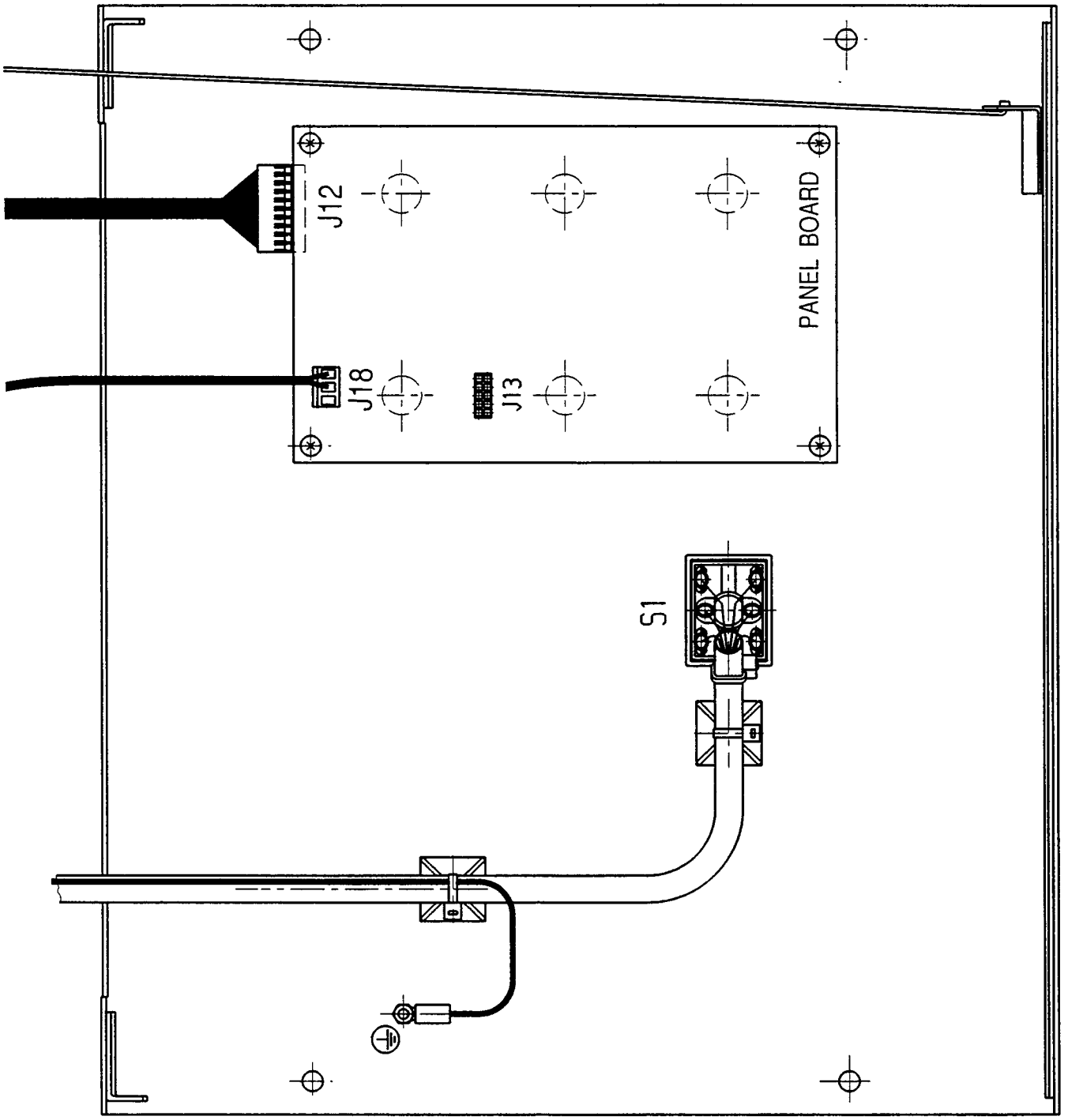
***Steuergerät MEL61/62** - Anschlussplatte*
***Control unit MEL61/62** - Connector panel*



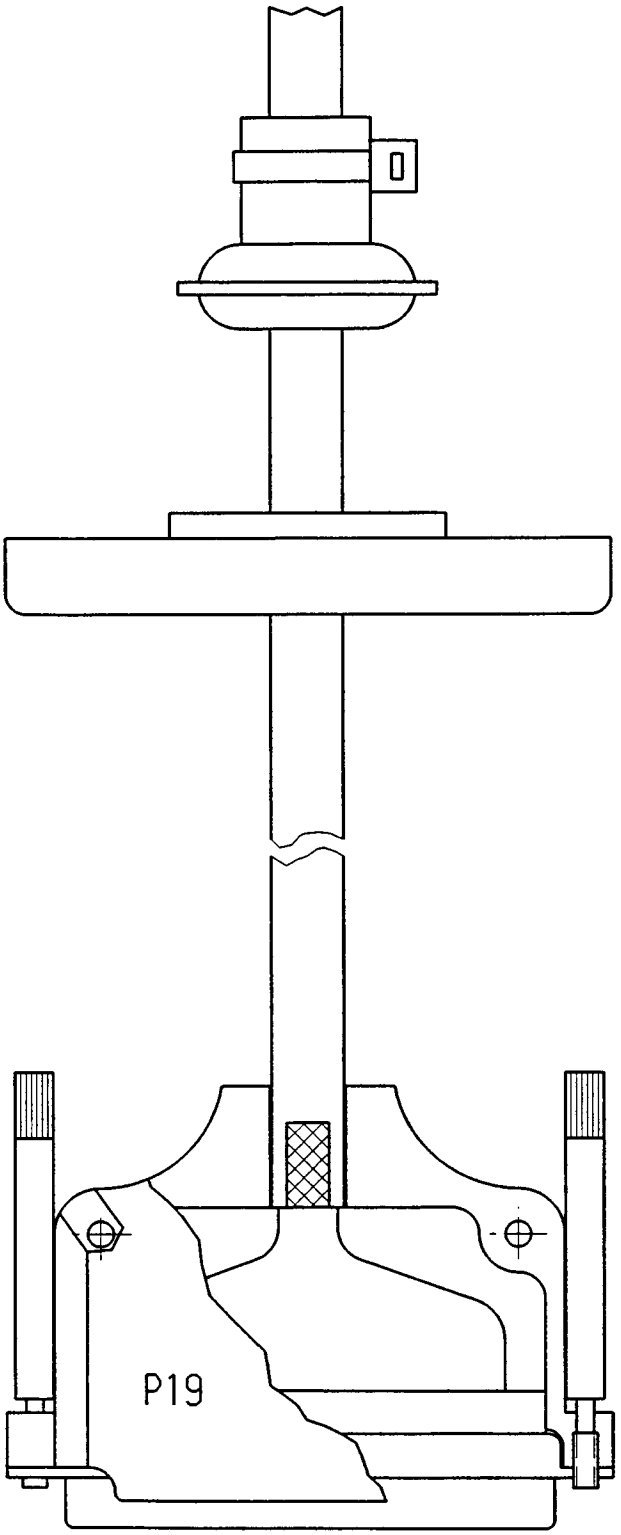
***Steuergerät MEL61/62** - Rückwand*
***Control unit MEL61/62** - Rear section*



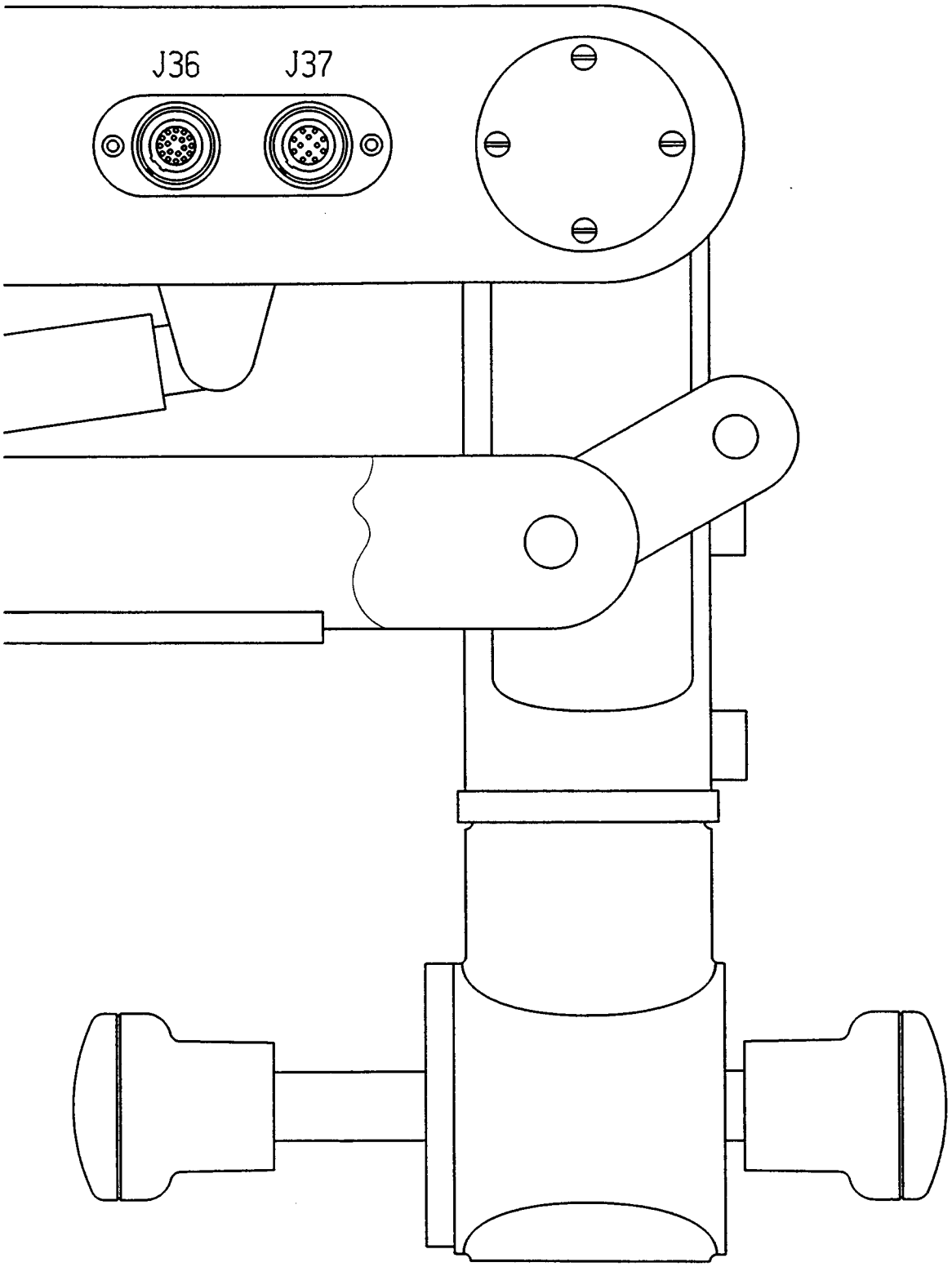
Steuergerät MEL61/62 - *Front*
Control unit MEL61/62 - *Front section*



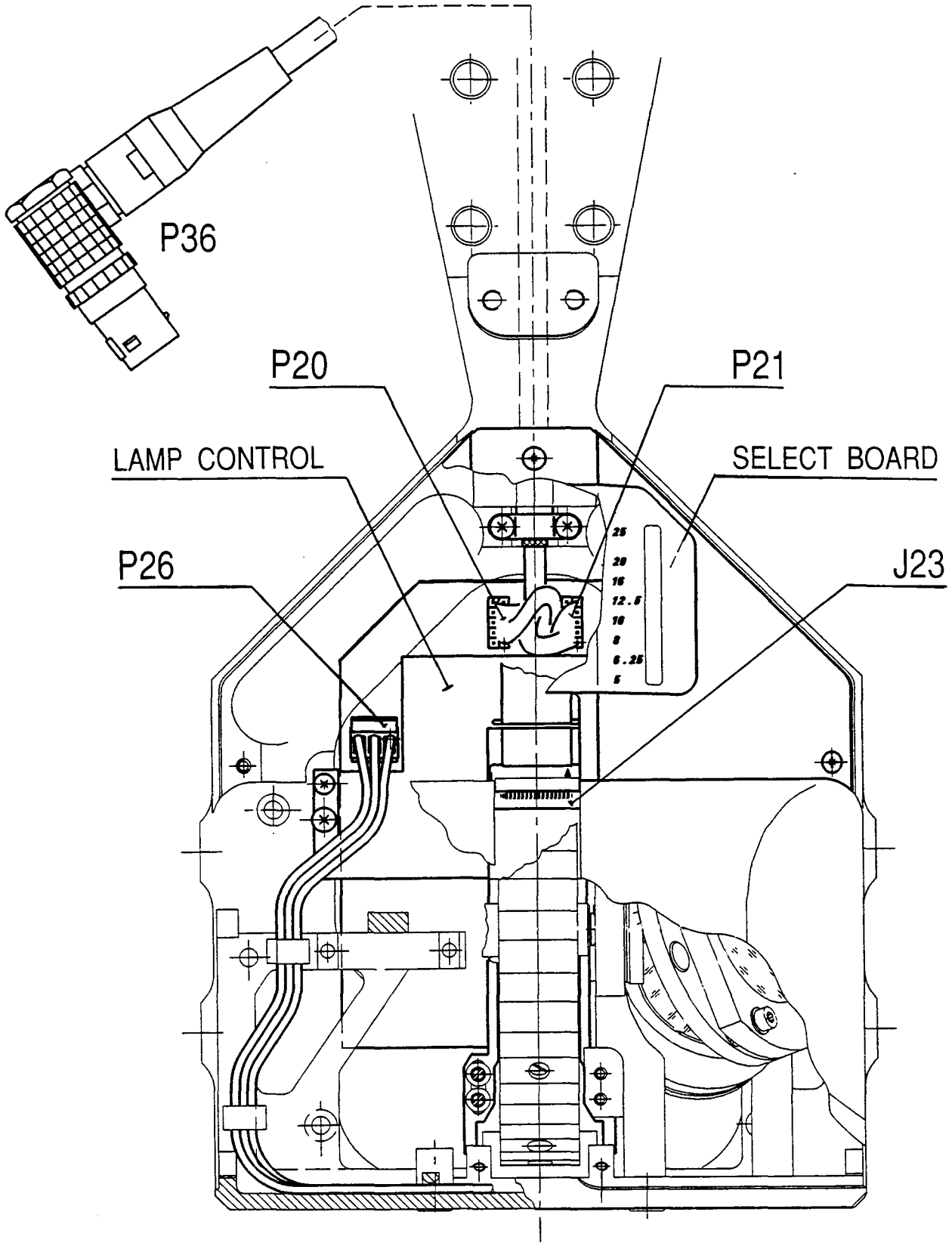
***Schwenkarmkabel** - Stecker zum Steuergerät*
***Swing arm cable** - Connector to control unit*



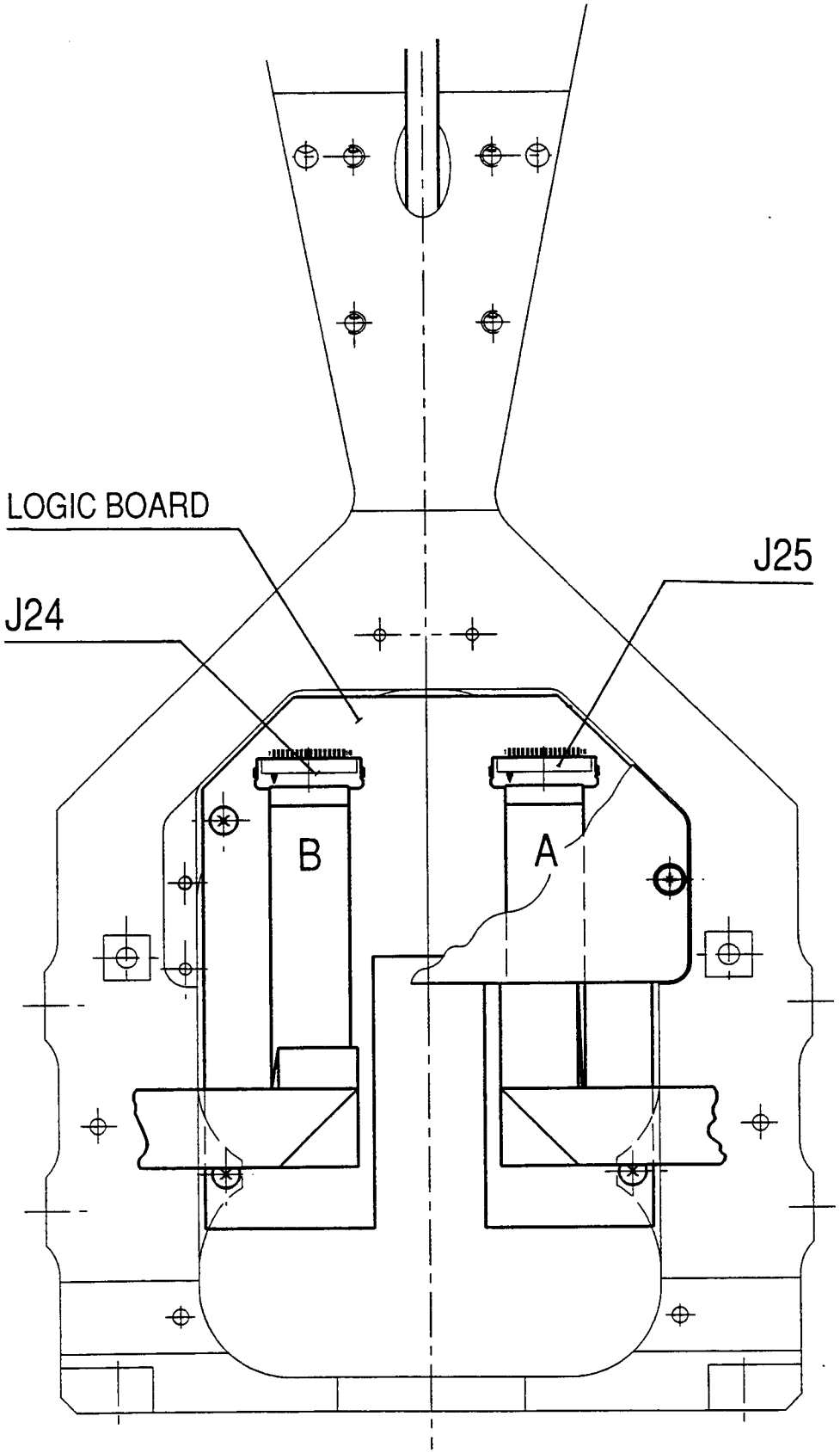
Schwenkarmkabel *- Stecker zum Mikroskop M680 und XY-Gear*
Swing arm cable *- Connector to microscope M680 and XY-Gear*



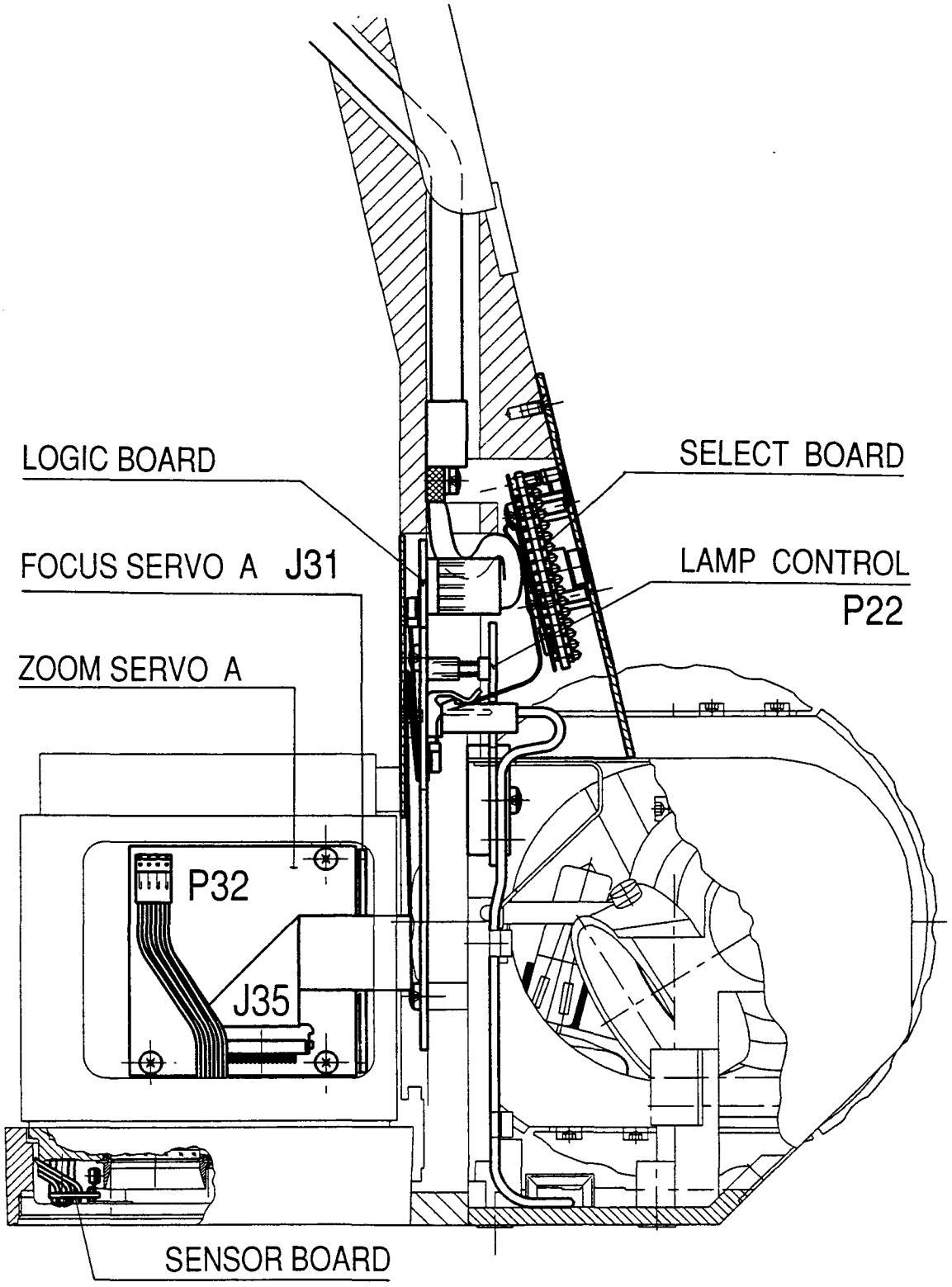
***Mikroskop M680** - Ansicht auf Beleuchtungseinheit*
***Microscope M680** - View to lamp unit*



***Mikroskop M680** - Ansicht auf Optik-Modul*
***Microscope M680** - View to optical module*

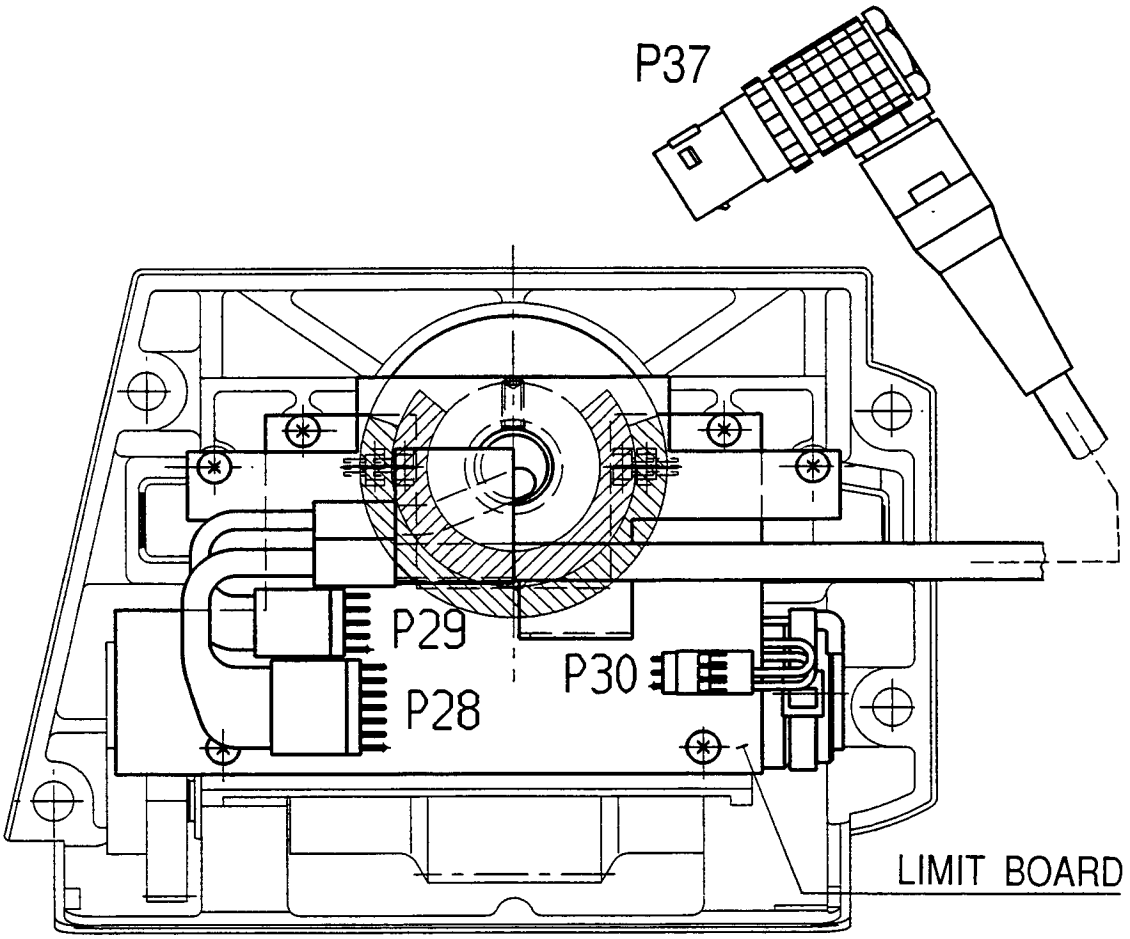


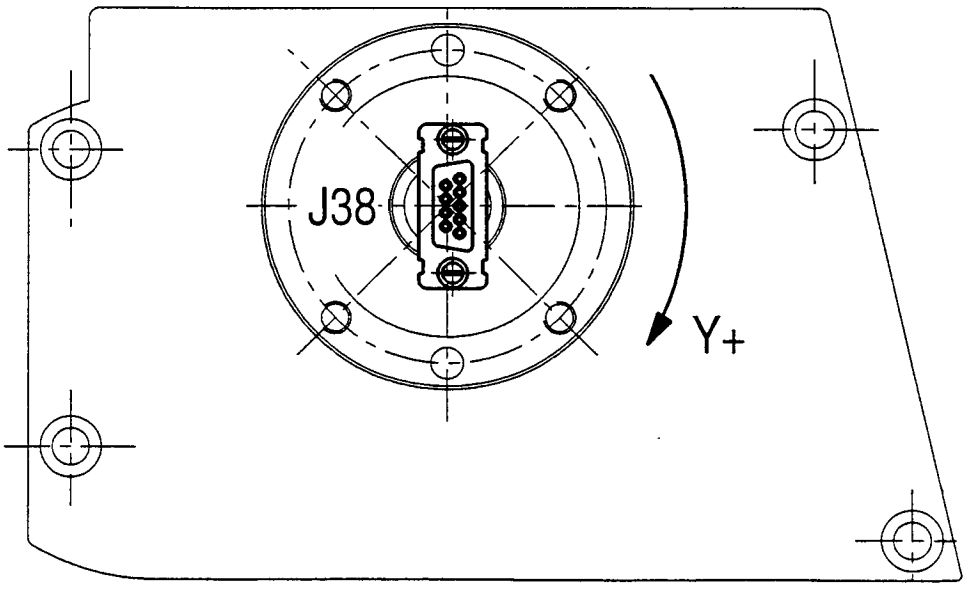
***Mikroskop M680** - Seitenansicht auf Mikroskop A*
***Microscope M680** - Side view to microscope A*



Y-Gearbox: *1.Ansicht der Rückseite auf das Limit Board*
2.Frontansicht - Definition der Drehrichtung

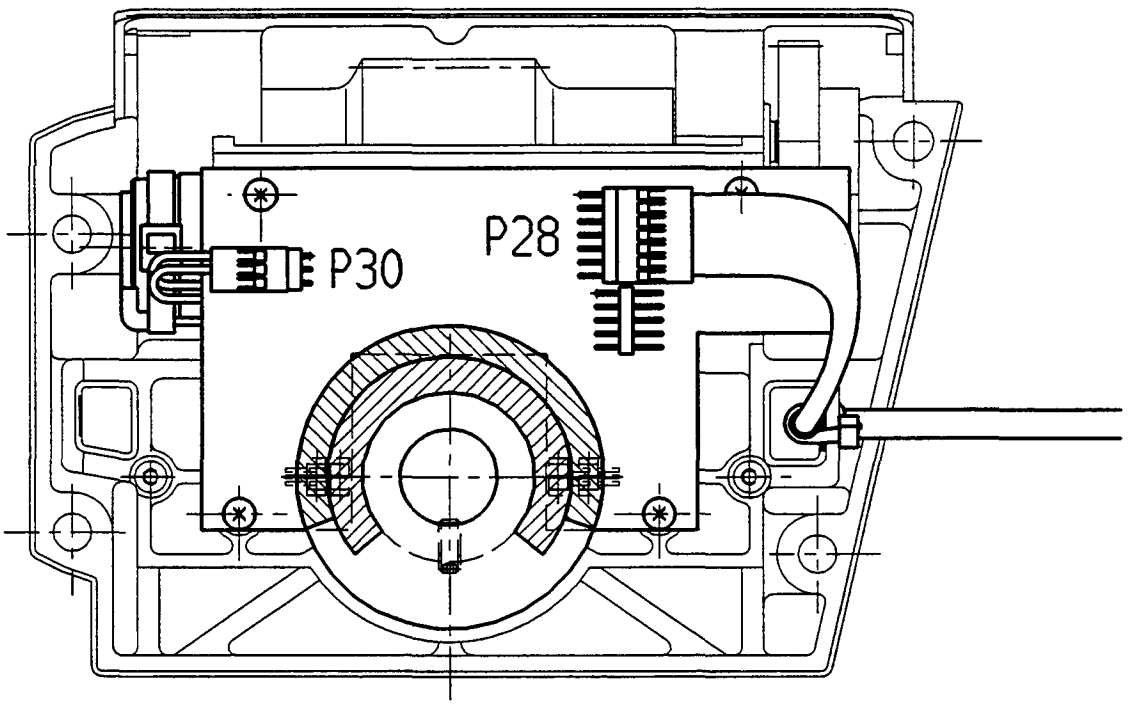
Y-Gearbox: *1.Rear view onto Limit board*
2.Frontview - defines direction of movement

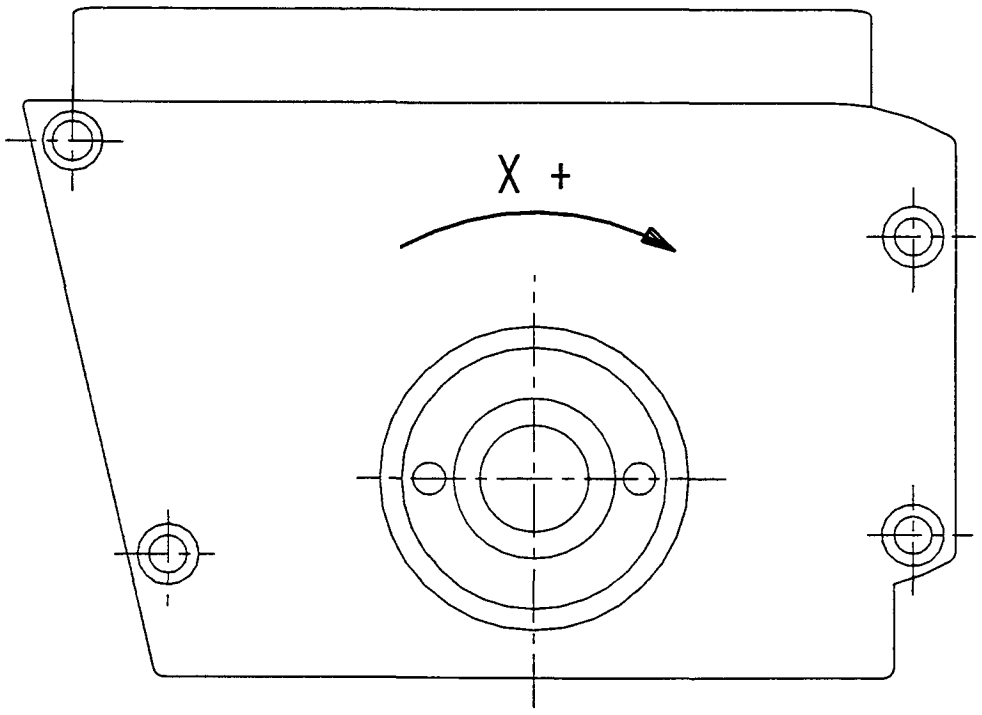


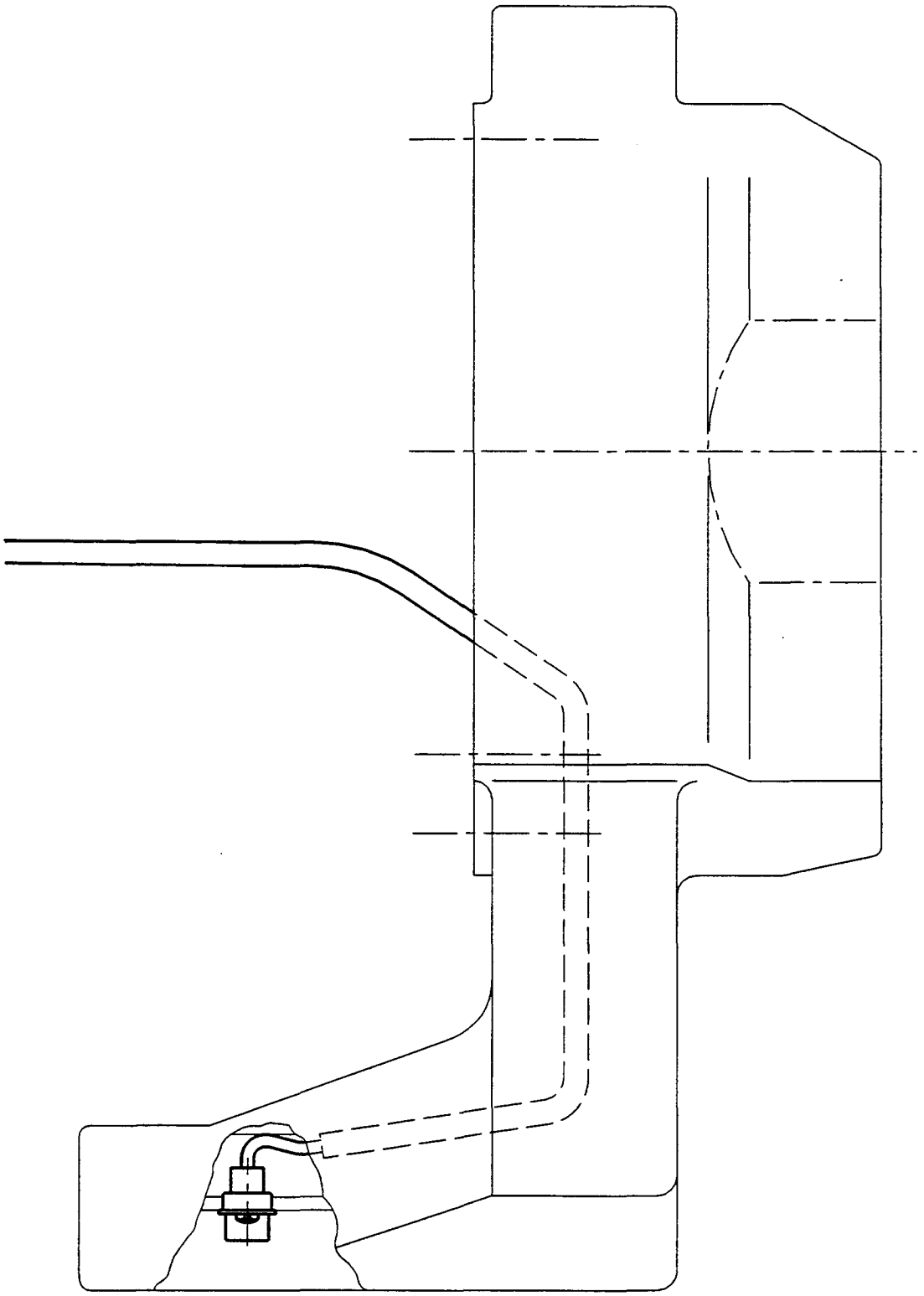


X-Gearbox: *1.Ansicht der Rückseite auf das Limit Board*
2.Frontansicht - Definition der Drehrichtung

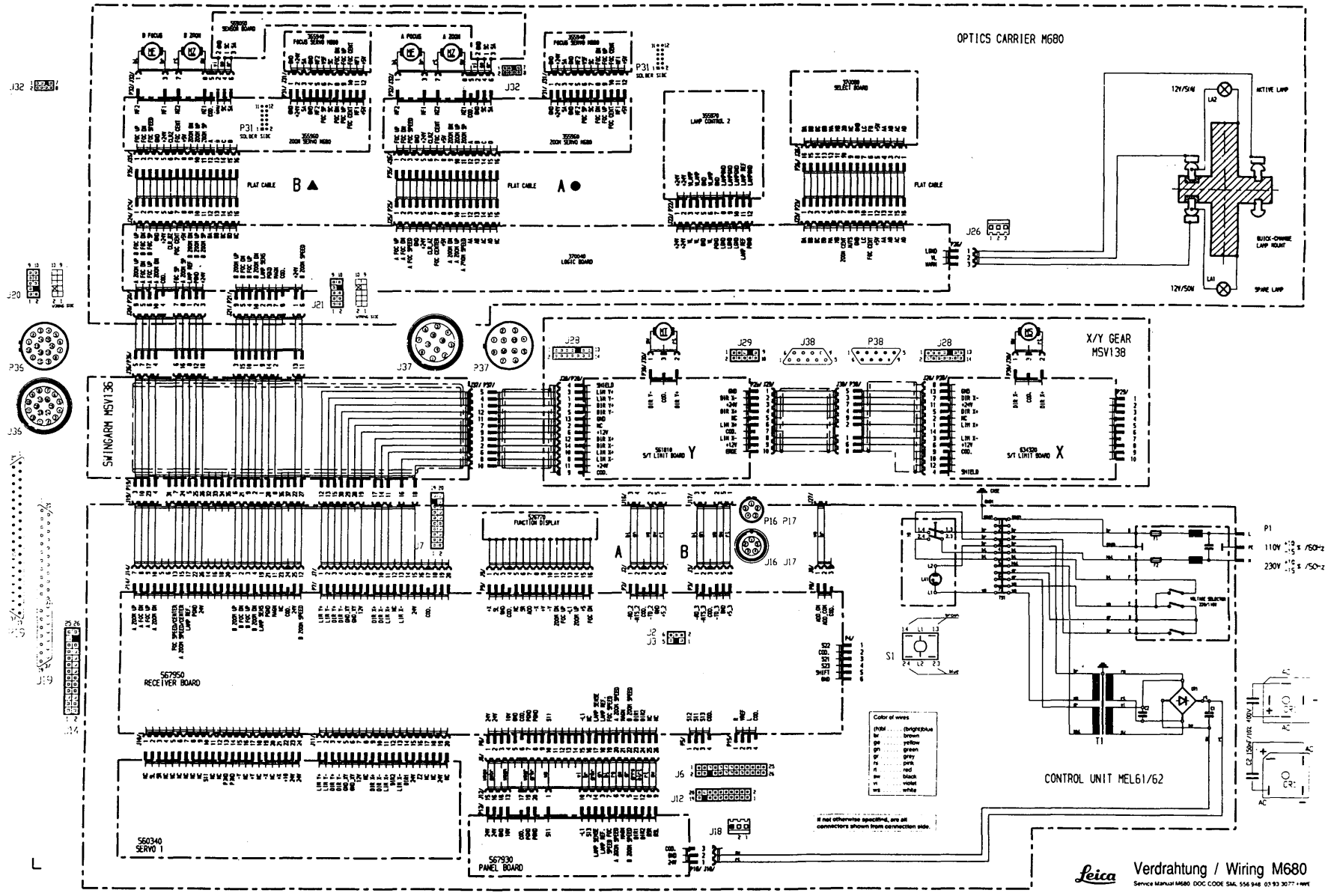
X-Gearbox: *1.Rear view onto Limit board*
2.Frontview - defines direction of movement







P38


OPTICS CARRIER M680
SWINGARM MSV136
X/Y GEAR MSV138
567950 RECEIVER BOARD
560340 SERVO 1
567930 PANEL BOARD
CONTROL UNIT MEL61/62
Color of wires
If not otherwise specified, are all connectors shown from connection side.
Leica
Verdrahtung / Wiring M680
Service Manual M680 DOC CODE SML 556 948 03 93 3077 +WE

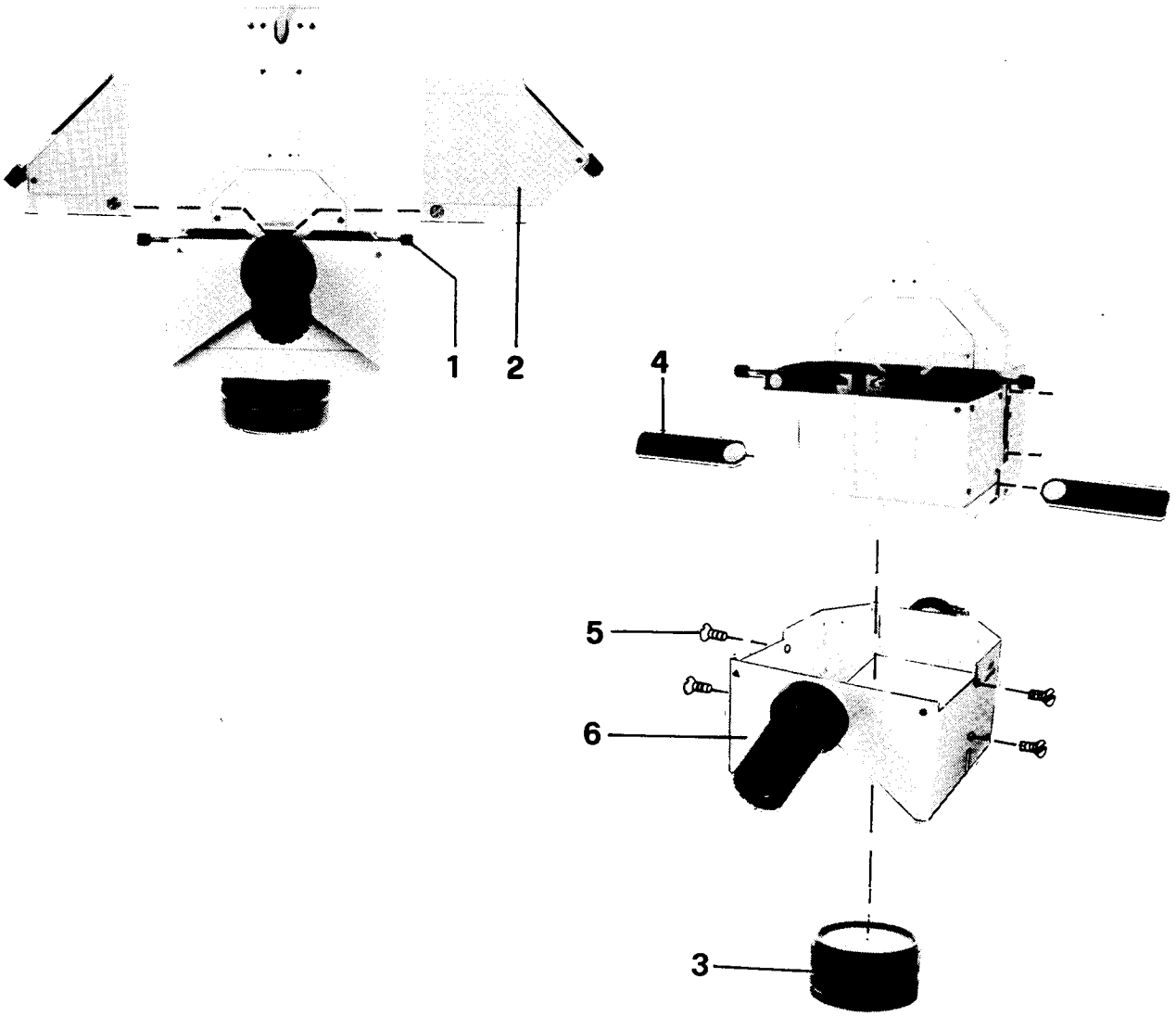
Replacing modules

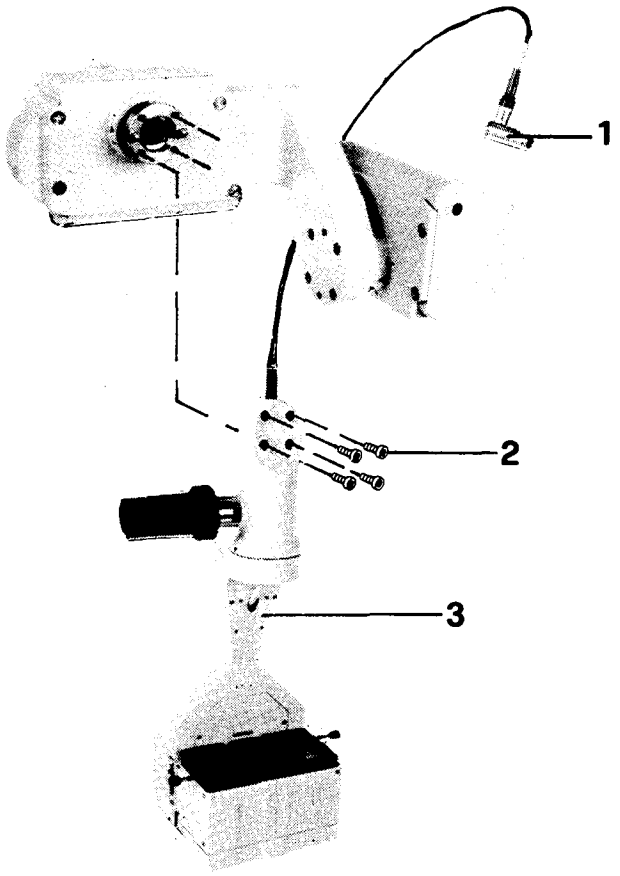
	Chapter/Page
Outer parts and system articles	10-1
Optics carrier, tiltable-movement carrier, swing-movement carrier	10-2
Illuminator	10-3
Optics carrier modules	10-4 - 10-6
Gas spring on swingarm MSV136/137	10-7 - 10-9
Swingarm cable	10-10 - 10-11

Outer parts and system articles

Release 2 screws (1) and remove stereo module (2).

Unscrew main objective (3). Remove 2 filters (4), 4 screws (5) and metal cover (6).





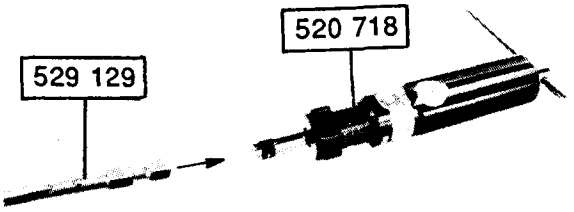
Optics carrier, tiltable-movement carrier, swing-movement carrier

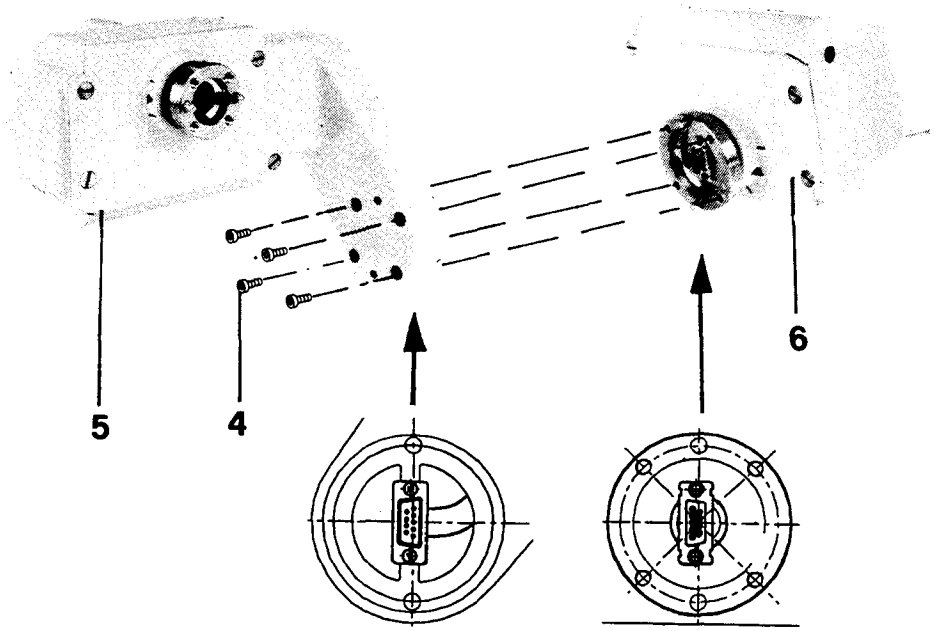
Pull Lemo plug (1) out of swingarm and remove 4 screws (2) and complete optics carrier (3).

Remove 4 screws (4). Separate swing-movement carrier (5) from positioning pins, and tiltable-movement carrier (6) from Cannon plug.

Assembly:
Tighten screws (2) and (4) with a torque of 8.8Nm

Note:
Insert the plug the right way round when replacing the cable of the swing-movement- or tiltable-movement carrier.



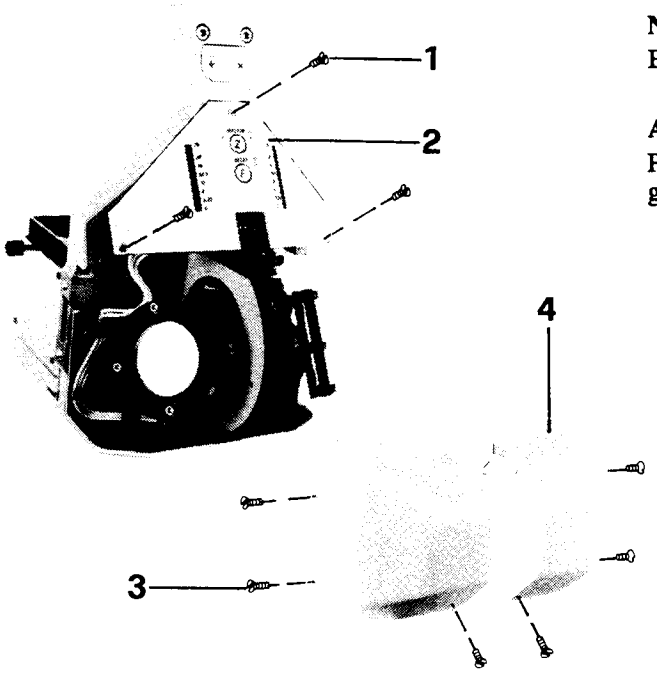


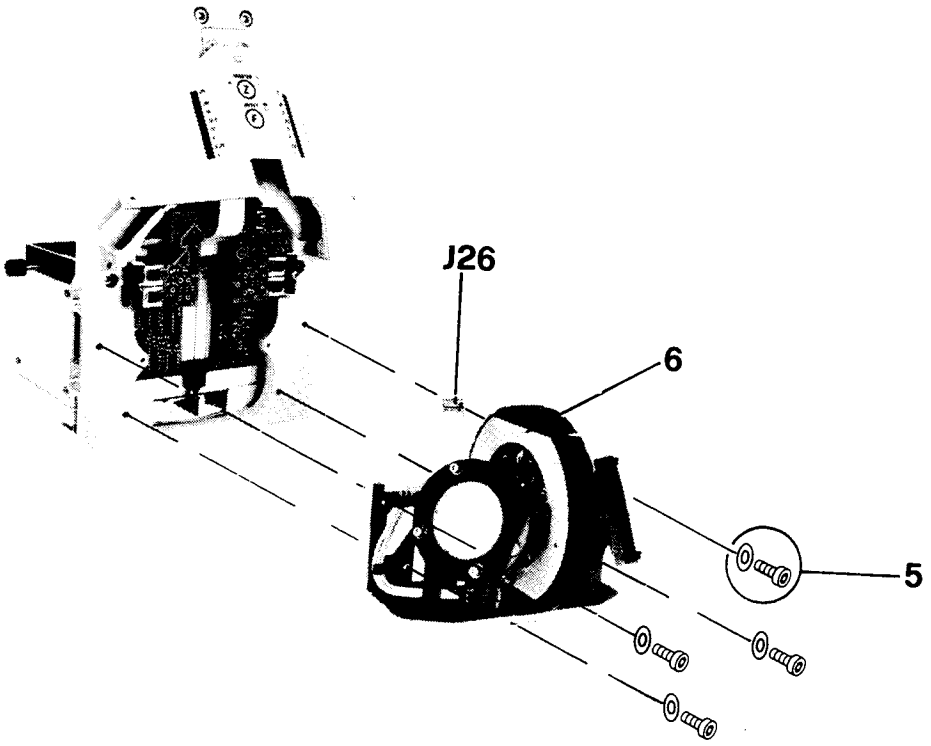
Illuminator

Remove 3 screws (1) and separate control panel (2). Disconnect plug J26 from illuminator. Remove 6 screws (3), 2 housings (4), 4 screws with washers (5), and illuminator unit (6).

Note:
Be careful not to damage the illuminator prisms.

Assembly:
Push the illuminator fully downwards at right-angles to the screwholes, and tighten the screws.

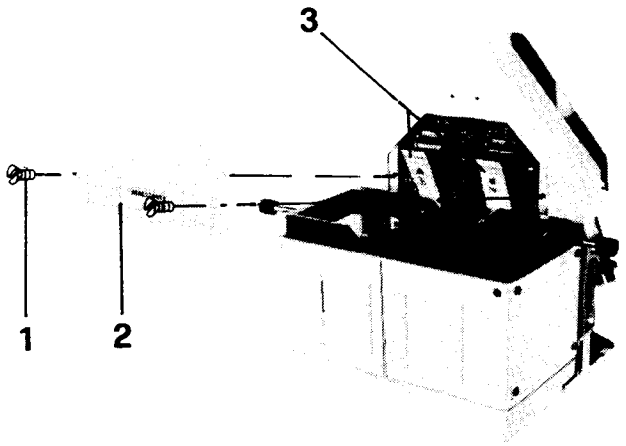


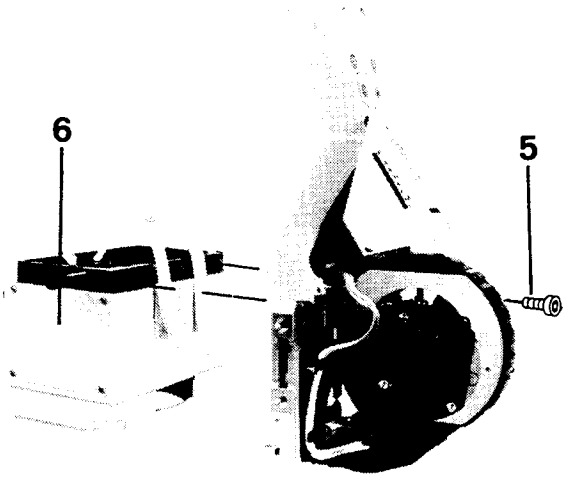


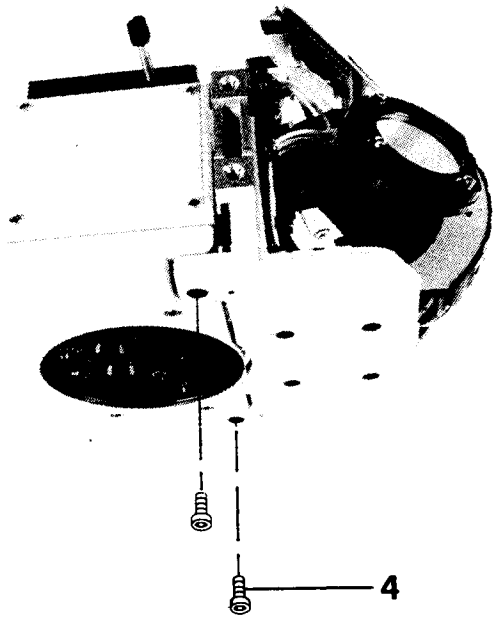
Optics carrier modules

Remove 2 screws (1) and cover plate (2). Disconnect flat cables A and B (3). Tilt microscope unit and remove 2 screws (4).

Remove 2 screws (5) and extract optics carrier (6).

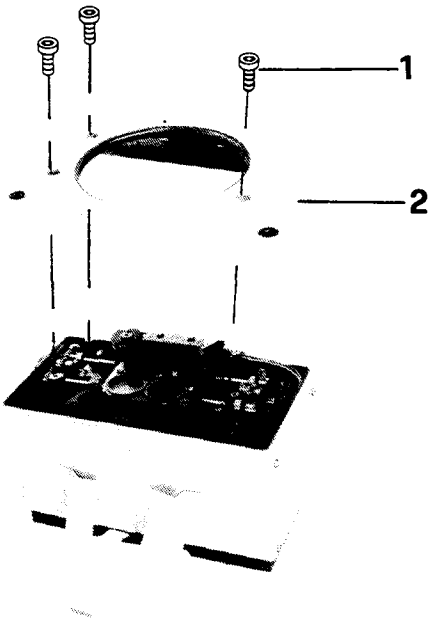


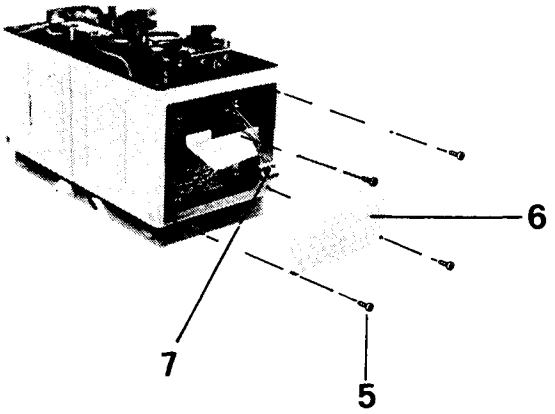


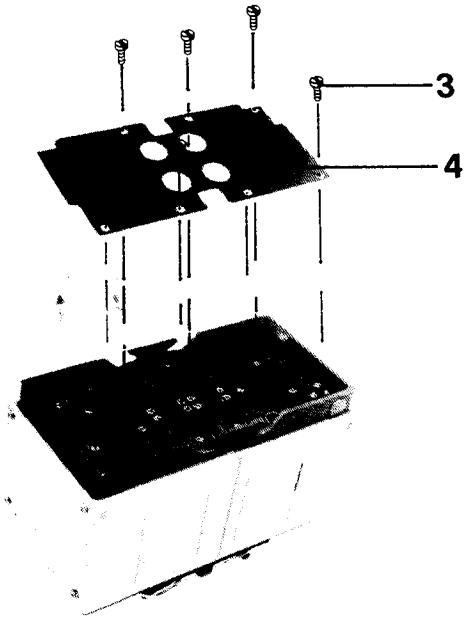


Remove 3 screws (1), housing shell (2), 7 screws (3) and stop (4).

Remove screws (5) and plate (6) from optics carrier which is to be replaced. Pull out plug J32 (7).



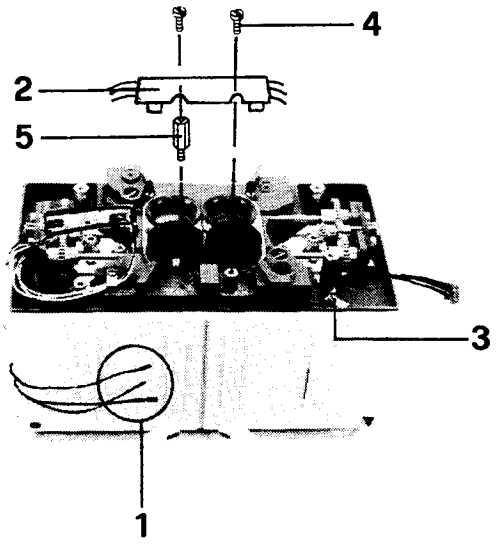




Disconnect 3 contacts (1) of sensor board (2) from socket strip J32.

Free clip (3), remove 2 screws (4), and remove sensor board.

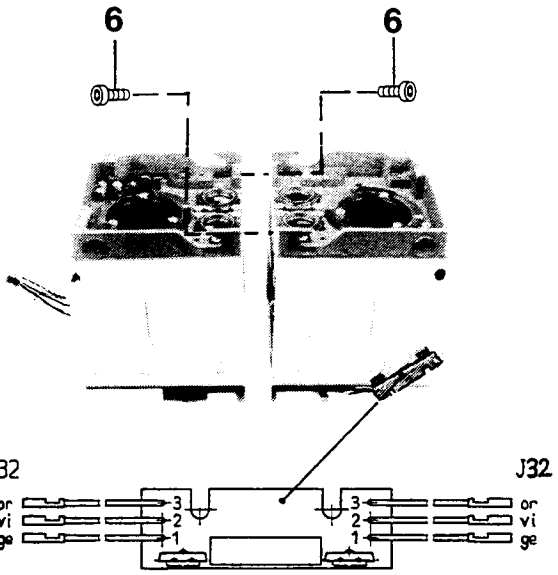
Remove spacer bolts (5) and 3 screws (6), and separate the red and blue optics carrier modules.

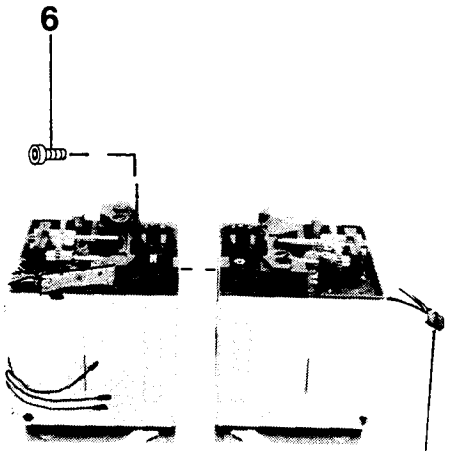


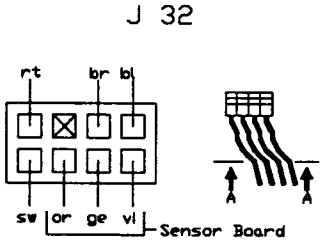
Assembly

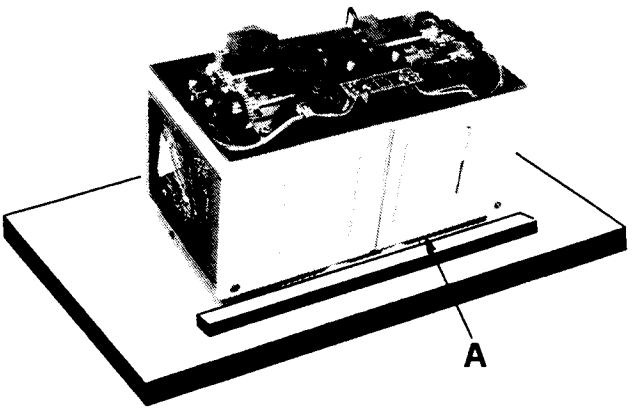
Place the red and blue optics carrier modules, with the bearing surfaces for stereo modules facing downwards, on a flat plate. Both modules are now aligned at the same height.

Apply a flat object to the side of the stereo module guide (A) to ensure that the modules are also laterally aligned. Fully tighten screws (6).

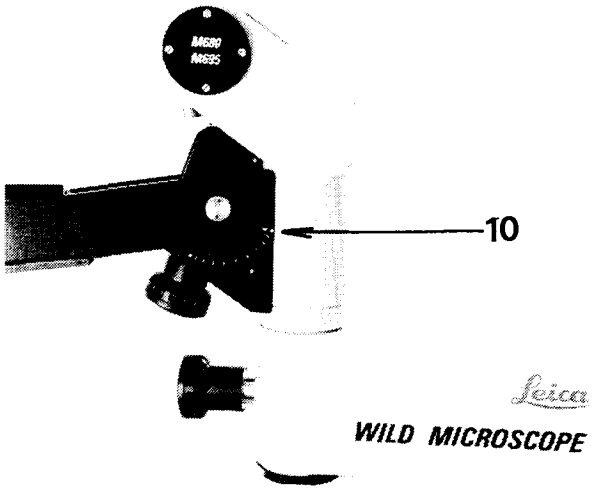






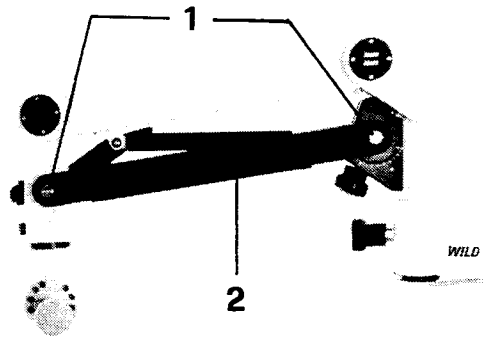


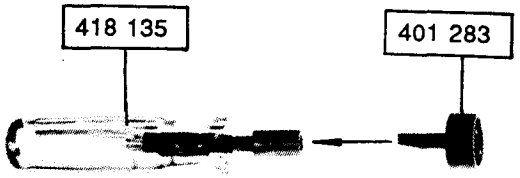
Gas spring of swingarm MSV136/137

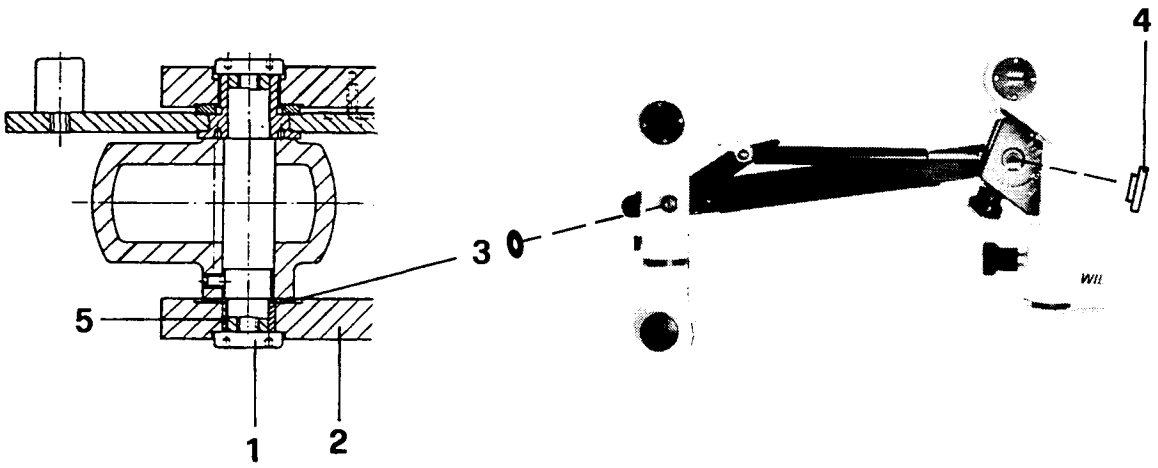


Set counterbalance to "10". Remove 2 screws (1) and parallel bar (2). Remove washer (3) and pakking piece (4).

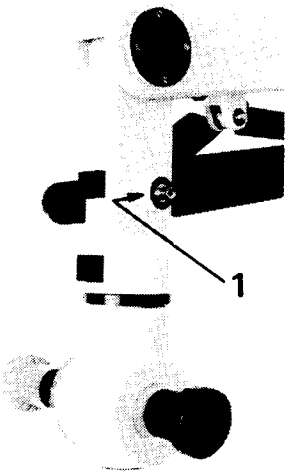
Note:
The hole-to-hole distance of the parallel bar can be set by turning the eccentric sleeve (5).

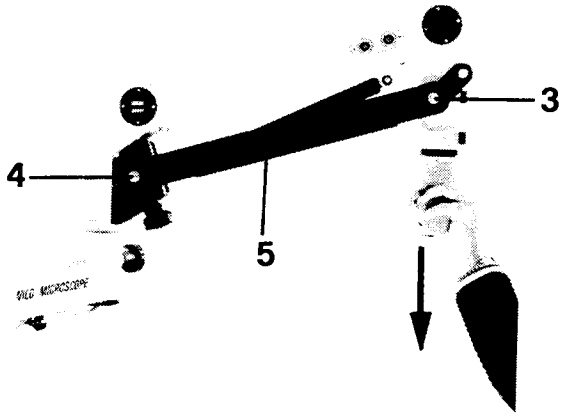


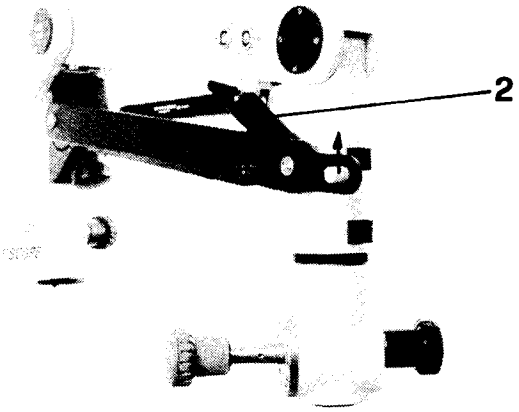




Release screw (1), disengage safety hook (2).
Pull swingarm down until spindle (3) and screw (4) are tension-free. Remove spindle (3), screw (4) and parallel bar (5).

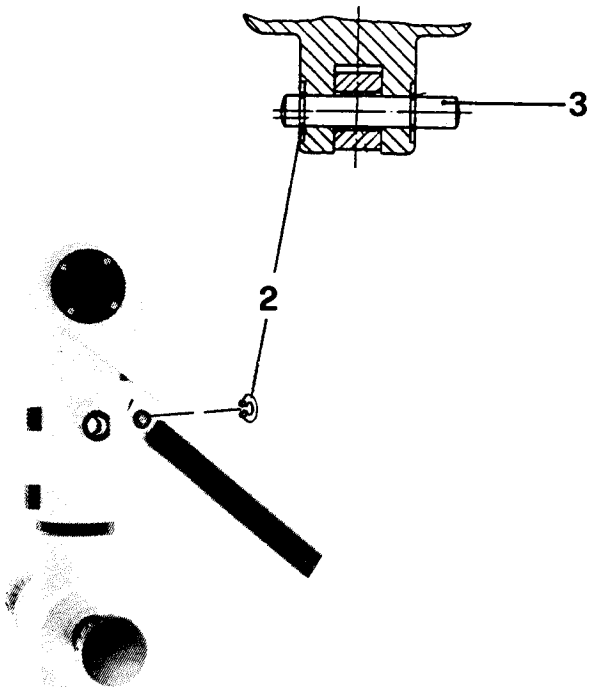




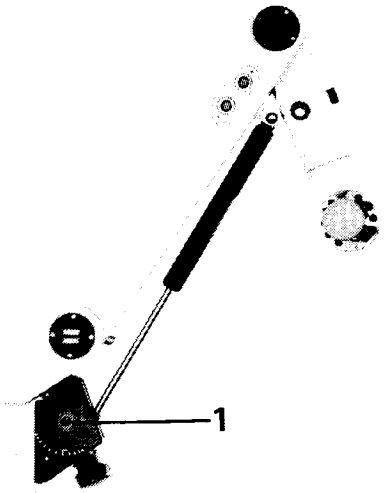


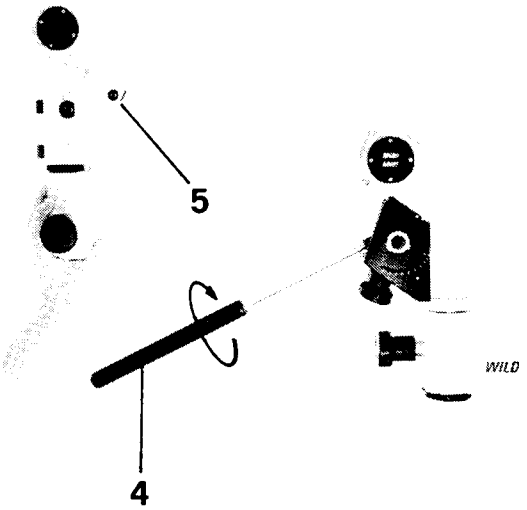
Remove spacer ring (1), safety ring (2) and pin (3).

Assembly:
Fit pin (3) with longer end towards safety hook.



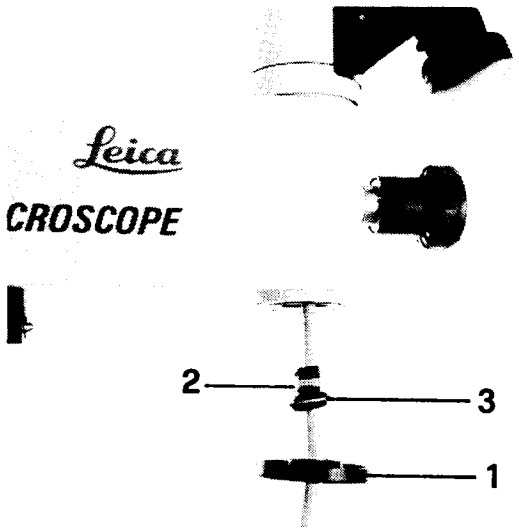
Remove gas spring (4) from mount (5) and unscrew it.





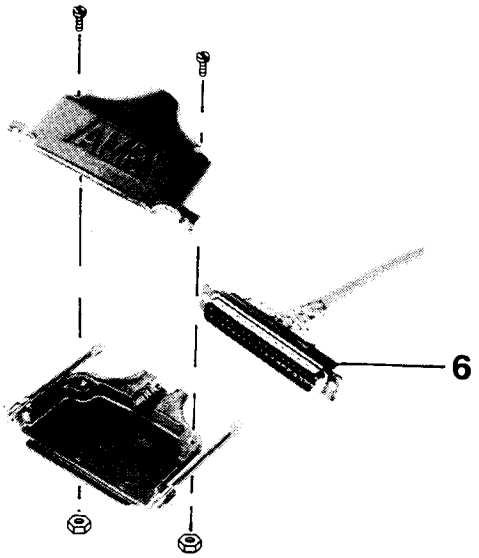
Swingarm cable

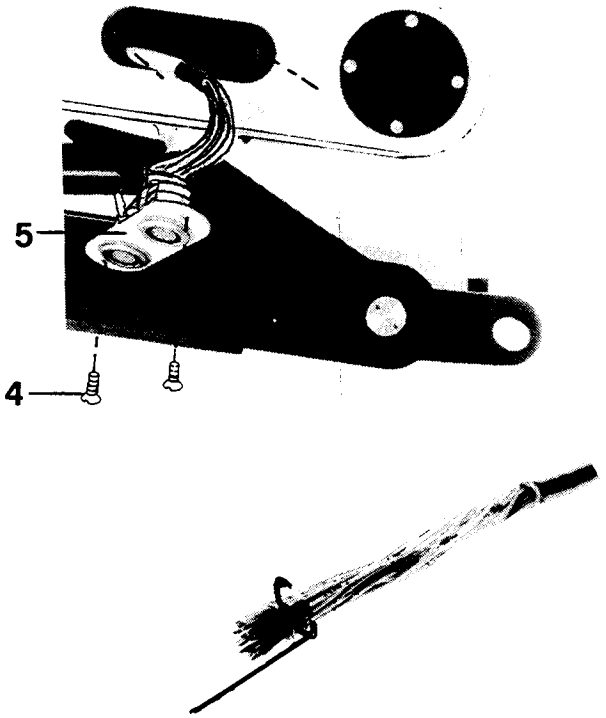
Screw off cover ring (1) and cut off cable tie (7) from cable guide (3).
Remove 2 screws (4) and extract cover (5) complete with Lemo plug. Open AMP plug (6) and push out contact pins backwards.



Note:
Before pulling out cable from swingarm, secure contact pins together with a long cord. Pull out swingarm cable. Cord enables new cable to be more easily pulled in afterwards.

Assembly:
Wind adhesive tape round contact pins on new cable and attach cord. Relieve swingarm of load, use cord to pull in cable.
Push contact pins into socket strip in accordance with diagram.
Position cable guide (3) one metre away from AMP plug and secure it with a new cable tie.

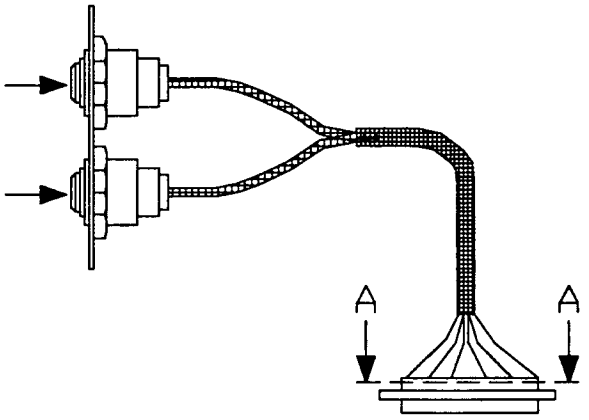


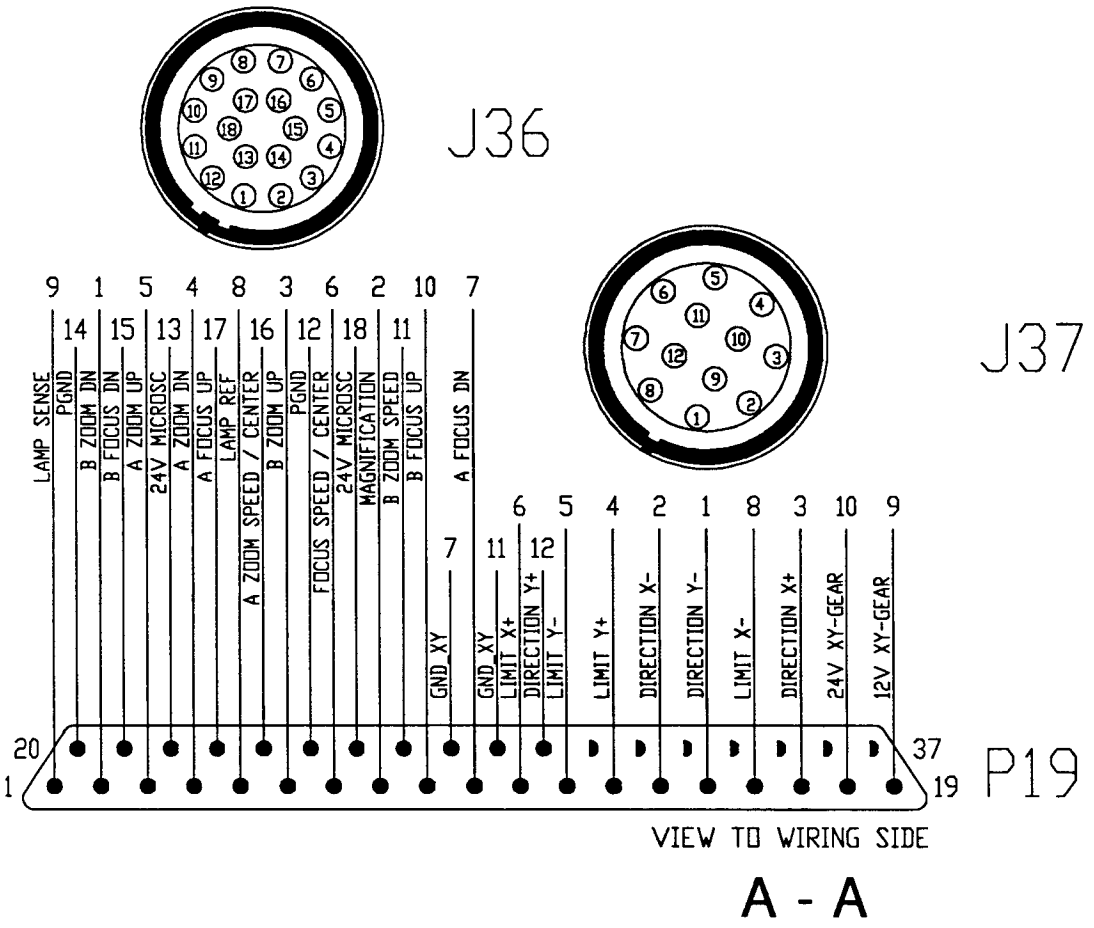


Swingarm cable

Inspect continuity of contacts in J36 and J37.

Plug wires into socket strip P19 in accordance with diagram.





Replacing boards

Chapter/Page

Optics carrier M680

Select board 11-1 - 11-2

Lamp control board, and zoom- and fokus servo boards 11-3 - 11-4

Sensor- and logic board 11-5 - 11-7

Swing- and tiltable joint MSV138

Limit board in swing-movement carrier 11-8 - 11-9

Limit board in tiltable movement carrier 11-10

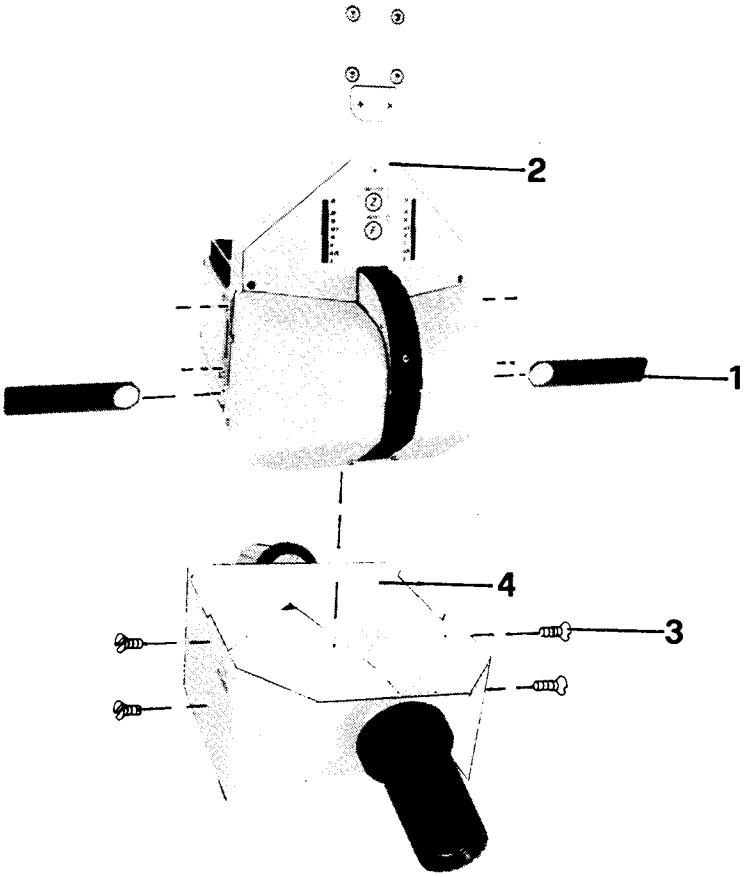
Control unit MEL61/62

Panel board 11-11

Servo- and receiver board 11-12 - 11-13

Optics carrier M680

Extract 2 filter slides (1) from suspension (2). Remove 4 countersunk screws (3) and take off cover plate (4) from beneath.

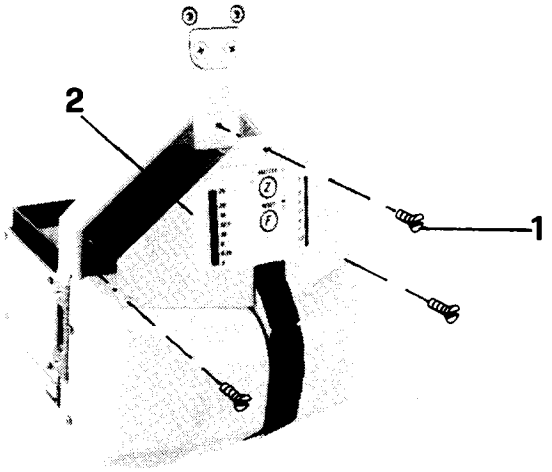


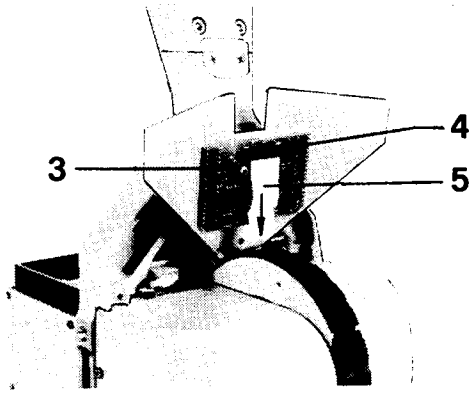
Select board

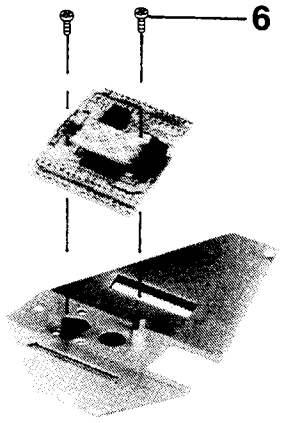
Note:
Colour-mark flat cable before unplugging it. Mark will serve as reference to avoid cable being fitted at an angle in a zero insertion force "ZIF" connector with resulting risk of short-circuiting.

Remove screws (1) and swing out control panel (2) with select board (3). Open ZIF connector (4) and extract flat cable (5) from beneath.

Remove 2 screws (6) and select board (3).

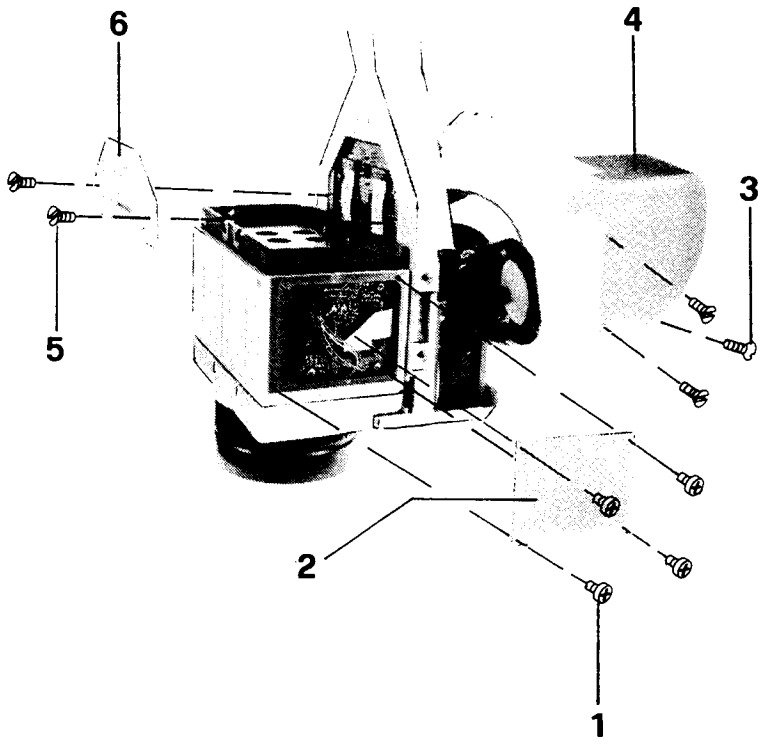






Lamp control board, and zoom- and focus servo boards

Remove 8 screws (1), 2 plates (2), 6 screws (3), 2 illuminator housings (4), 2 countersunk screws (5) and cover plate (6).

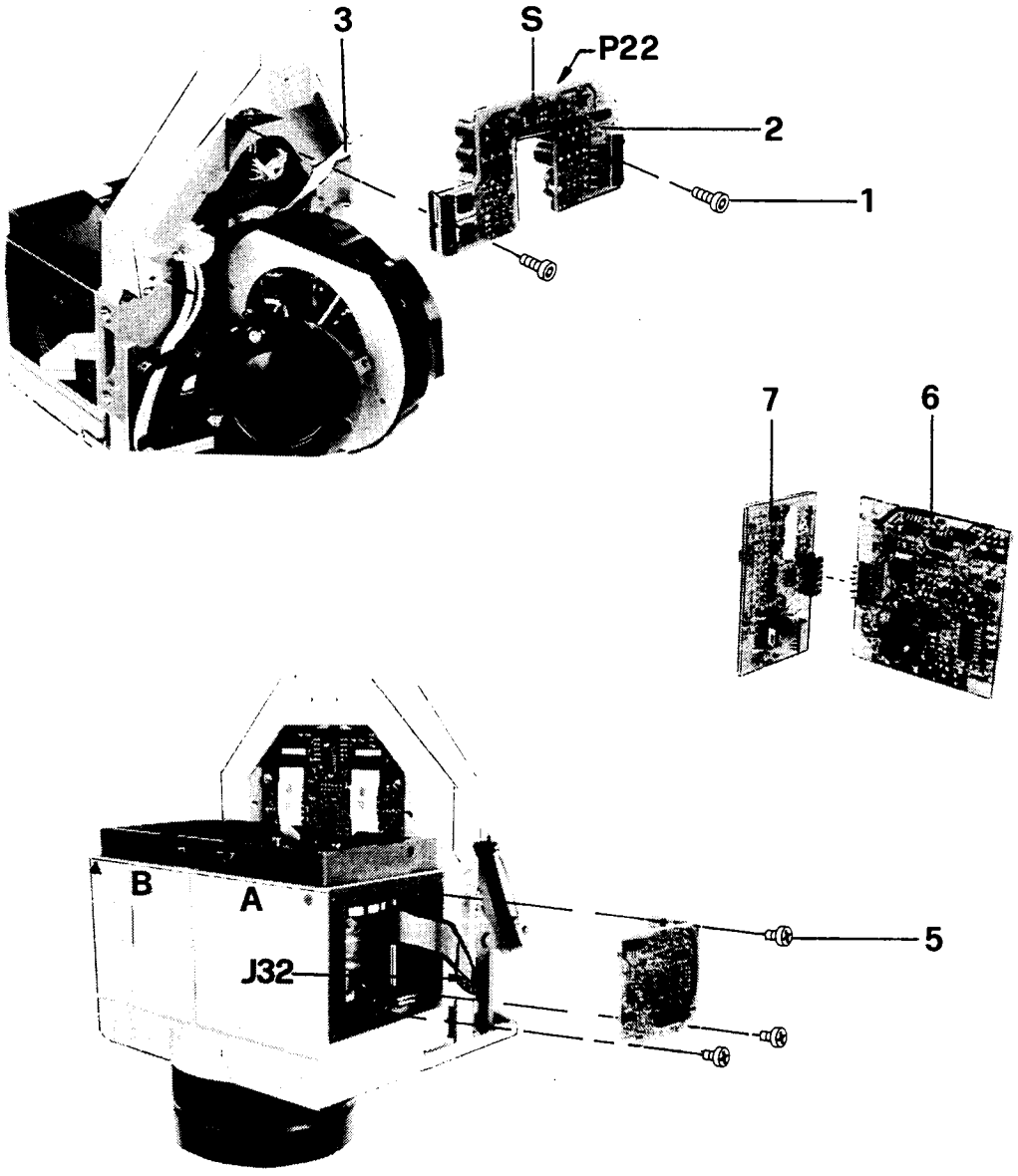


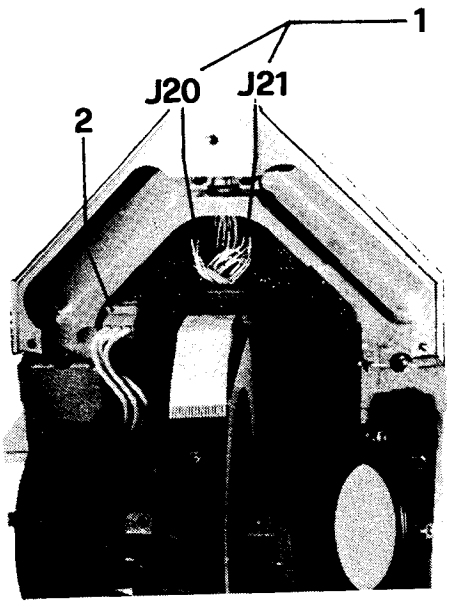
Remove 2 screws (1), and disconnect and extract lamp control board (2) (P22).

Assembly:
Thread flat cable (3) through slit (S).

Disconnect plug J32 and flat cable (4). Remove 3 screws (5). Remove zoom- (6) and focus- (7) servo boards.

Note:
The boards are dismantled in module B (blue) in the same way as in module A (red).



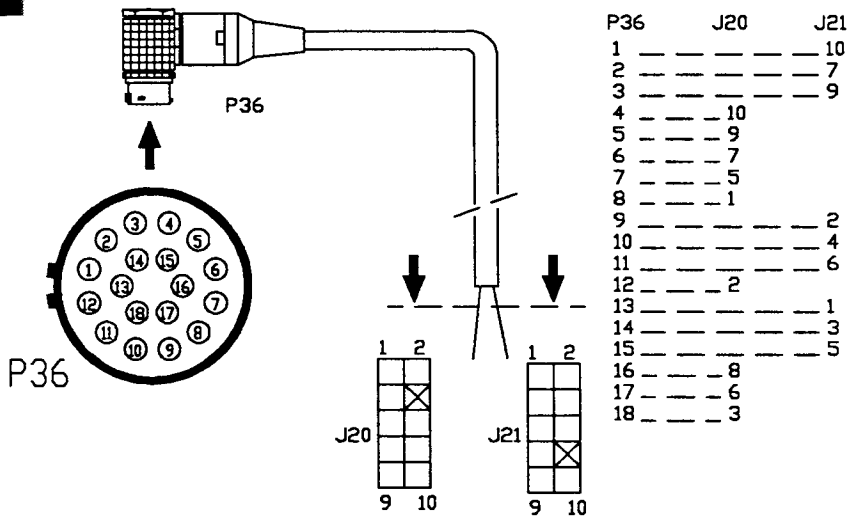


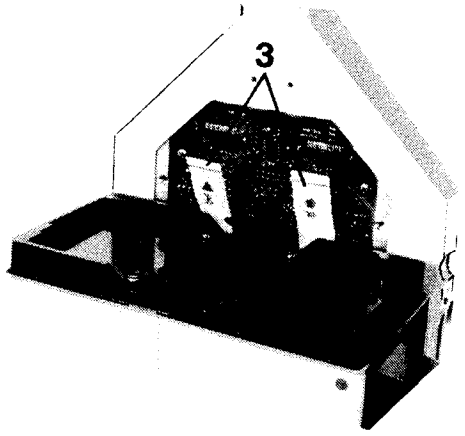
Sensor- and logic boards

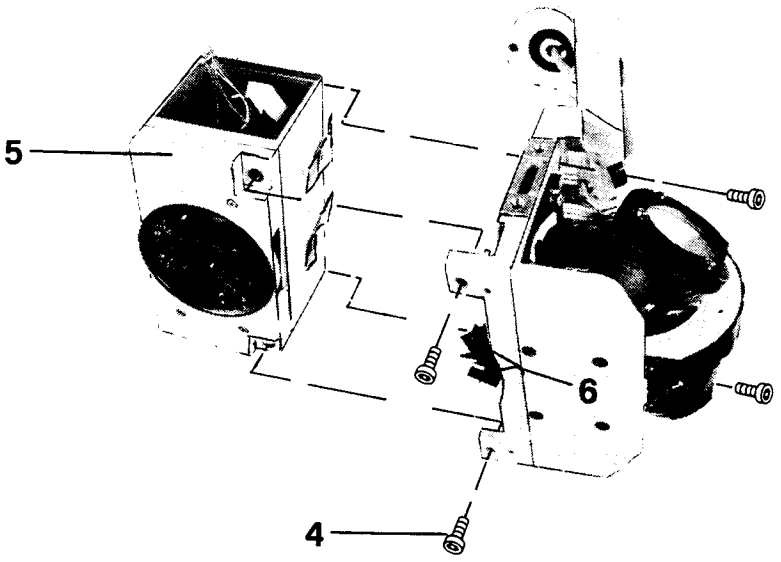
Note:
The illuminator prisms (6) protrude and are easily damaged.

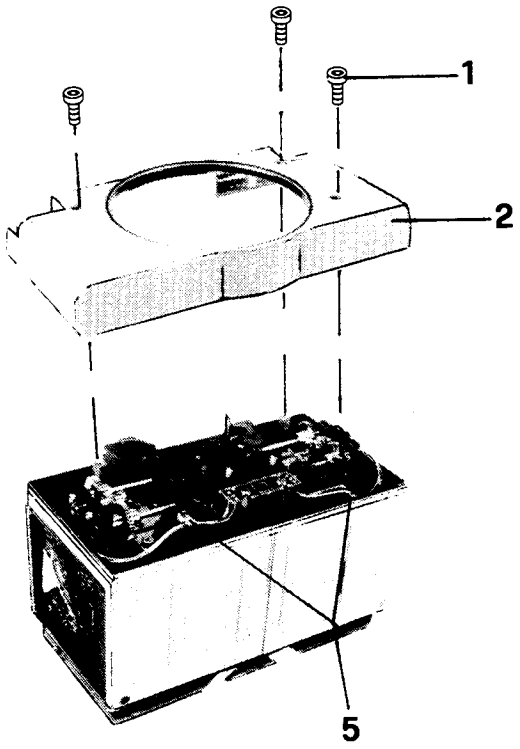
Disconnect plugs J20 and J21 (1) and J26 (2) to illuminator, and unplug flat cable (3).

Carefully remove 4 screws (4) and optics carrier (5).



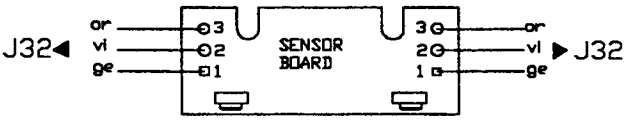


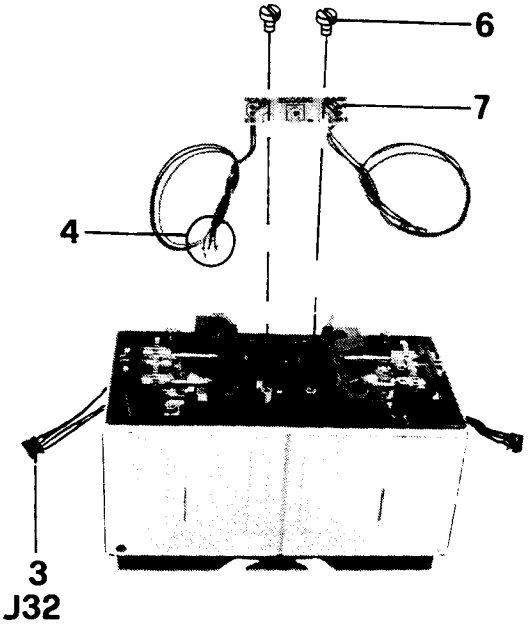


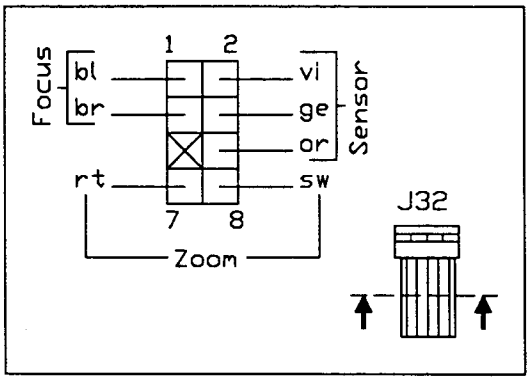


Remove 3 screws (1) and housing shell (2).
Disconnect 2 plugs J32 (3), and 3 contacts (4) from each socket strip J32. Release 2 cable ties (5) and remove 2 screws (6) and sensor board (7).

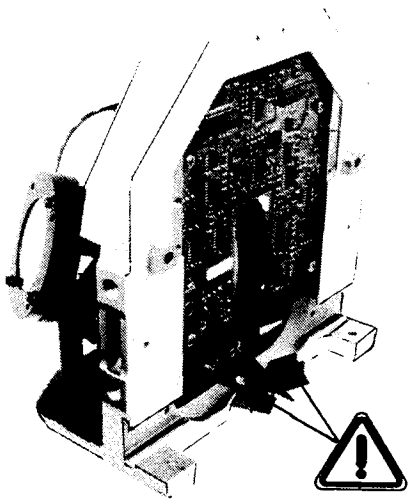
Assembly:
Press sensor board against screws (6) and tighten screws.

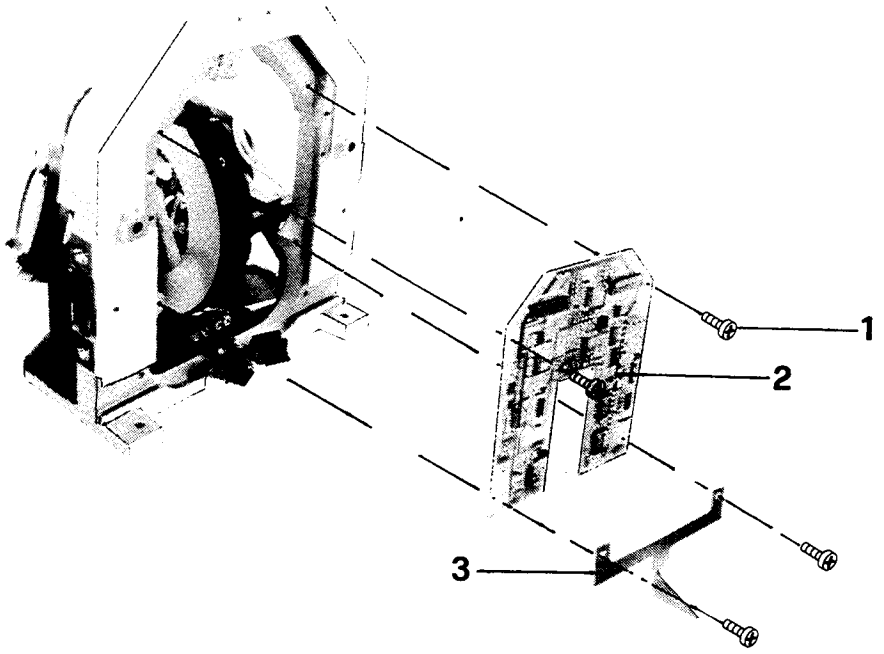




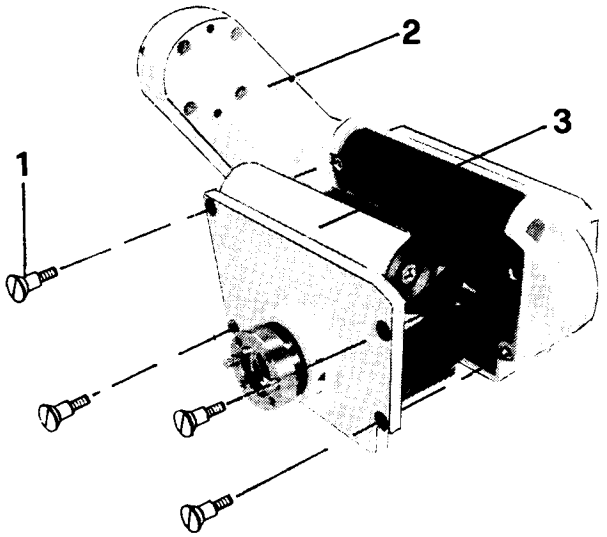


Remove 4 screws (1), logic board (2) and end piece (3).





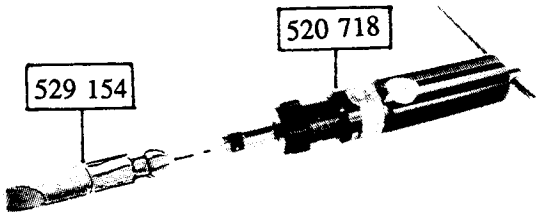
Swing- and tiltable movement carrier

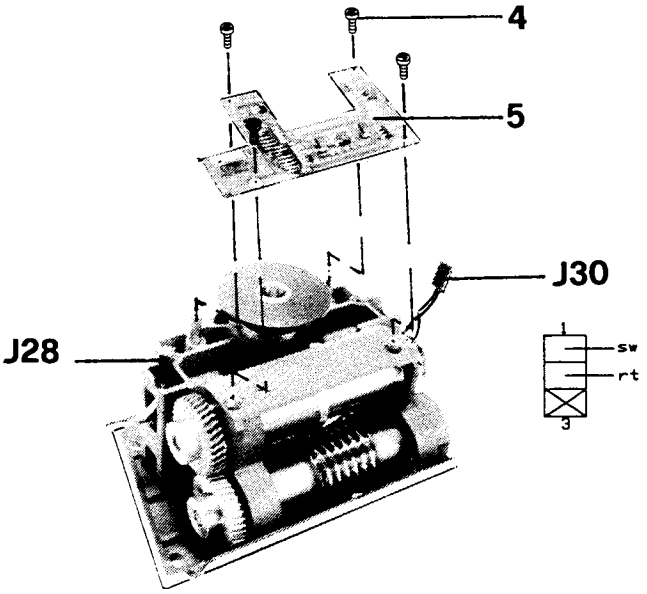


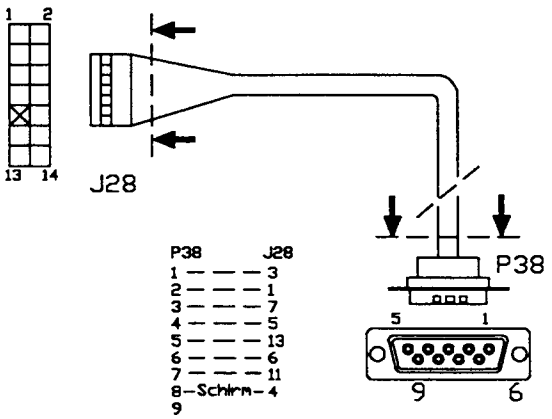
Limit board in swing-movement carrier

Remove 4 screws (1) from swing-movement carrier (2), extract gear unit (3), and cut off cable tie.

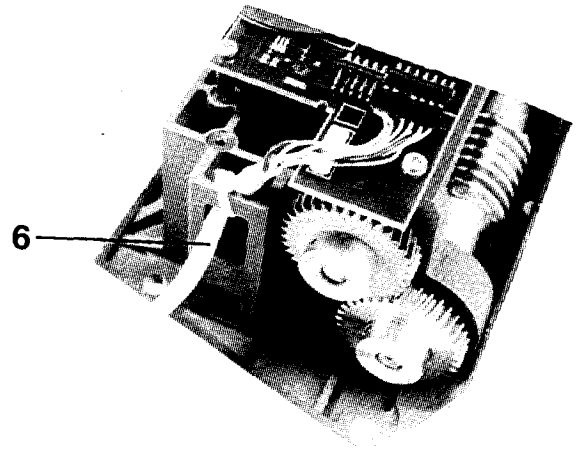
Disconnect plugs J28 and J30.
Extract plug J28 through opening (A), *see page 9.*
Remove 4 screws (4) and limit board (5).

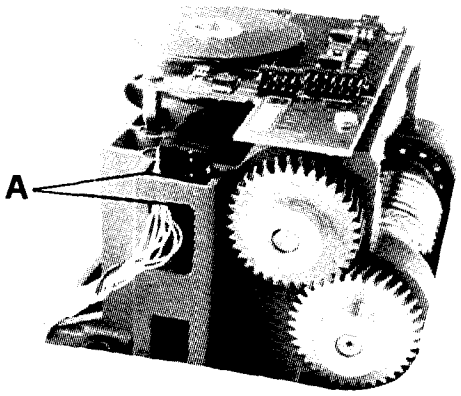


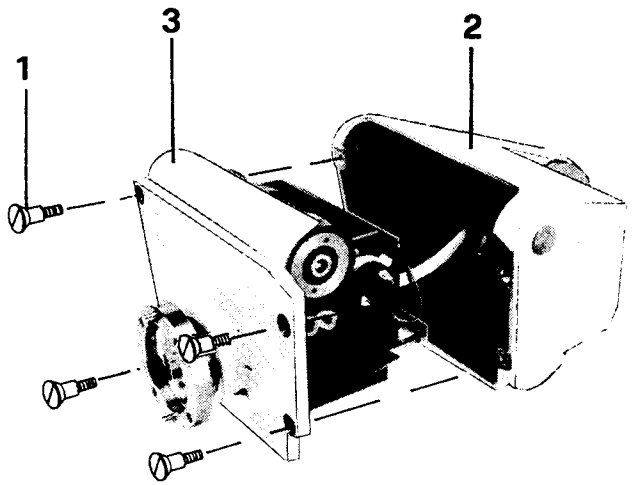




Assembly:
Secure cable (6) to housing, using cable tie, and push it back into housing until it cannot be damaged by gears. Fit gear unit and tighten screws (1) with torque of 8.8Nm.





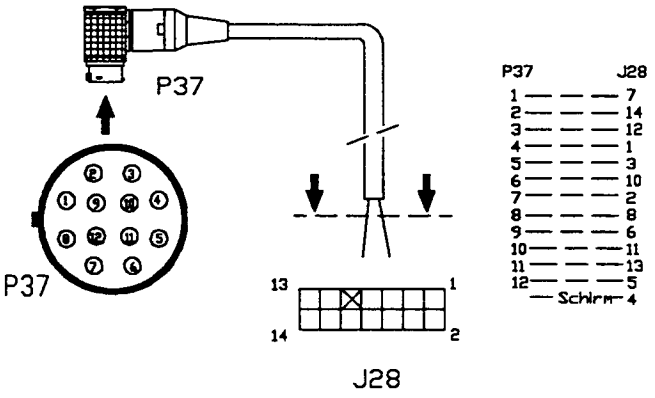


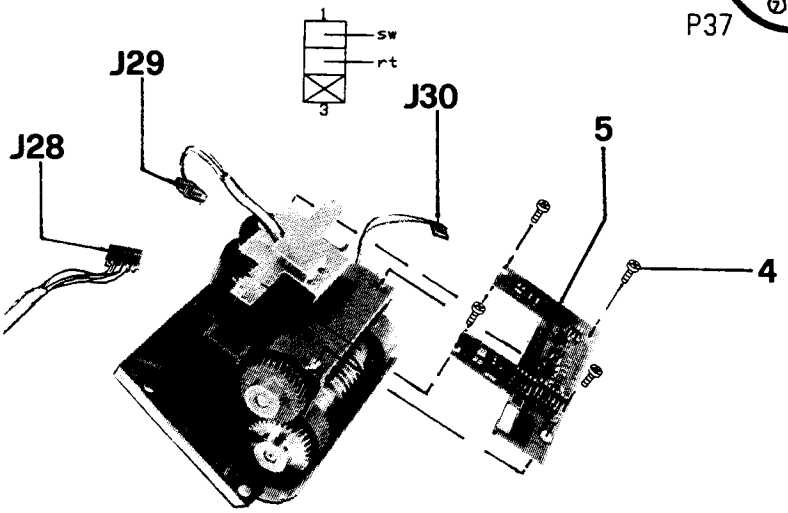
Limit board in tiltable carrier

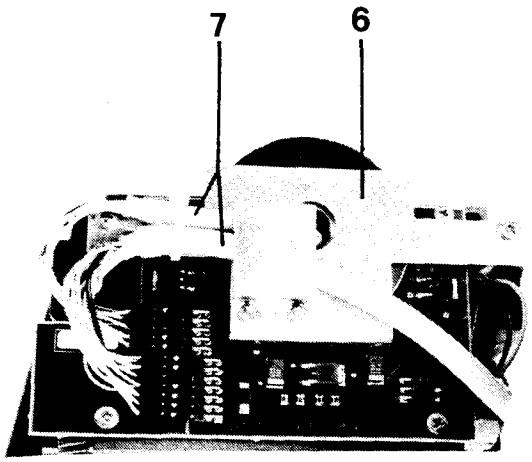
Remove 4 screws (1) from tiltable carrier (2) and extract gear unit (3).

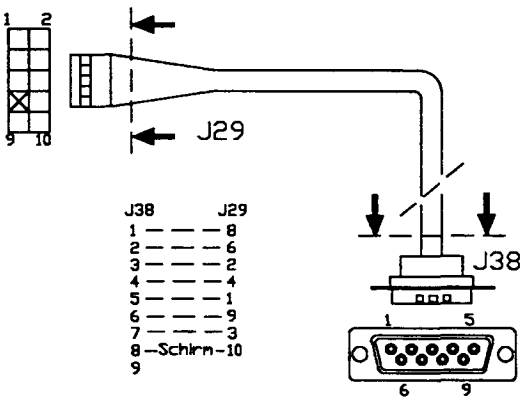
Disconnect plugs J28, J29 and J30. Remove 4 screws and limit board (5).

Assembly:
Secure 2 cables (7) to guide housing (6), using cable tie, and push them back into housing until they cannot be damaged by gears. Fit gear unit and tighten screws (1) with torque of 8.8Nm.

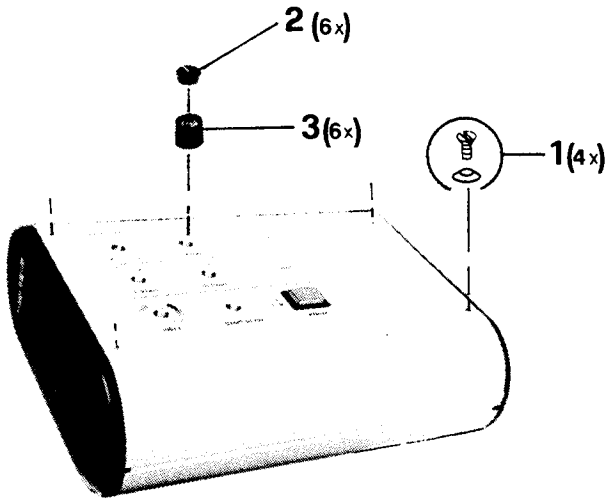








Boards for control unit MEL61/62

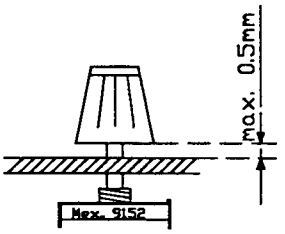


Panel board

Remove 4 screws with washers (1), knob cover (2) and knobs (3), and open front shell (4).

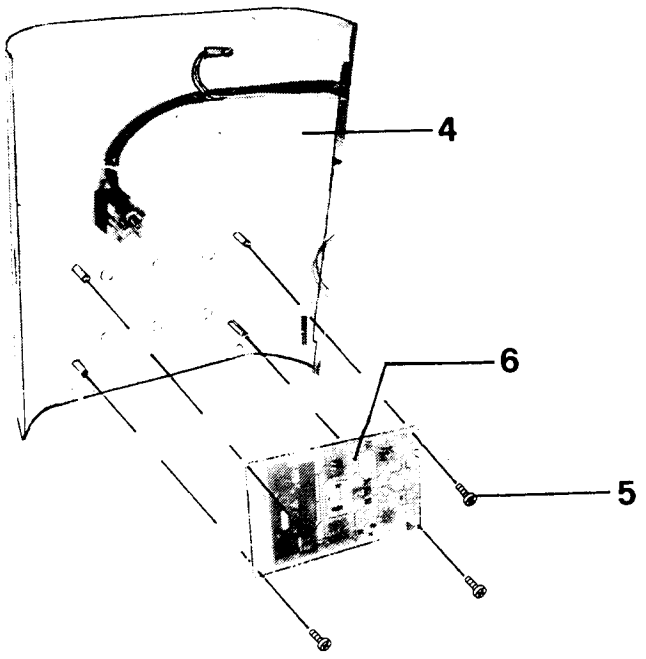
Pull out 2 plugs, remove 4 screws (5), and remove panel board (6).

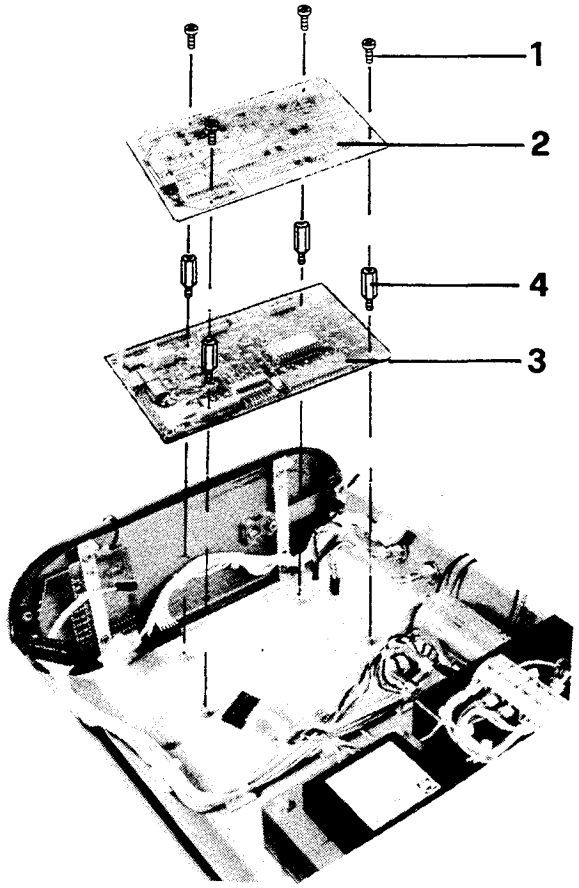
Assembly:
The maximum permitted distance between knobs and front shell is 0.5mm. Set the rotation limits for the knobs.



Panel Board

Brücke/Jumper		
BR1		
2-3		





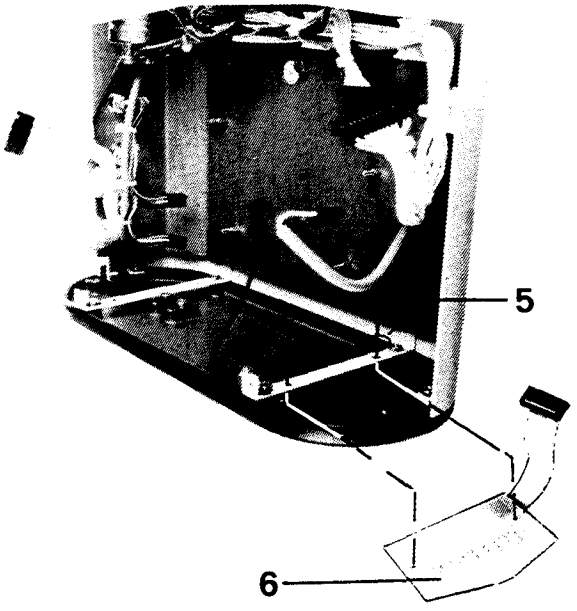
Servo- and receiver board

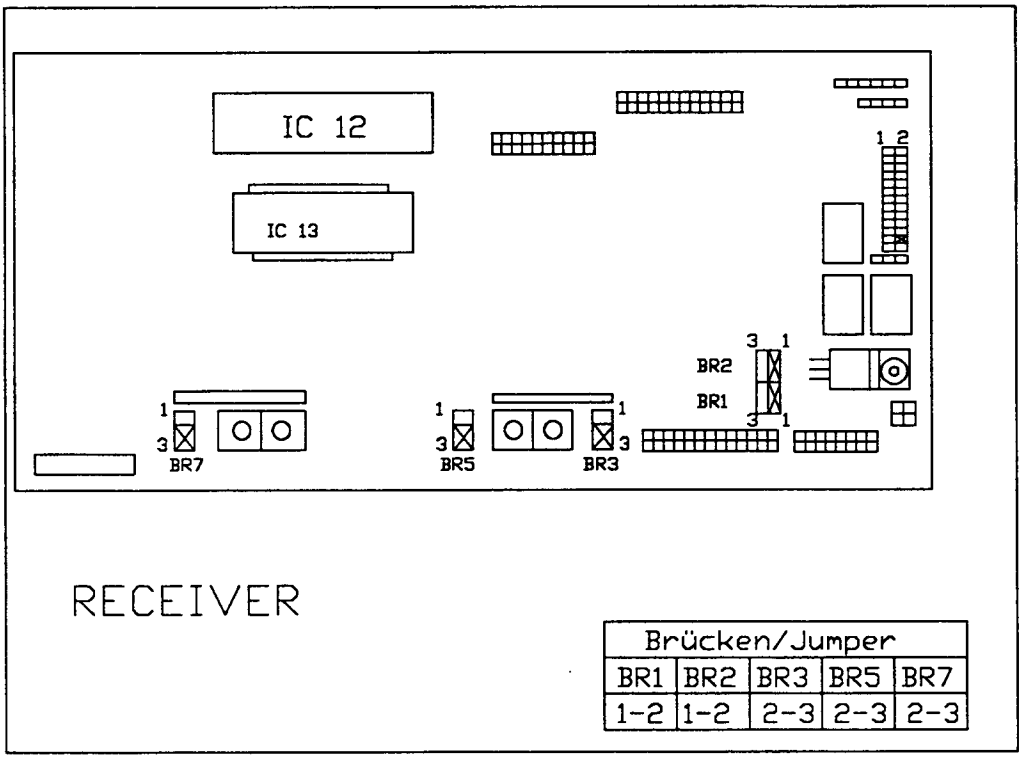
Remove screws (1) and pull servo board (2) upwards out of receiver board (3).
Pull 7 plugs out of receiver board.
Remove spacer bolts (4) and receiver board.

Function display

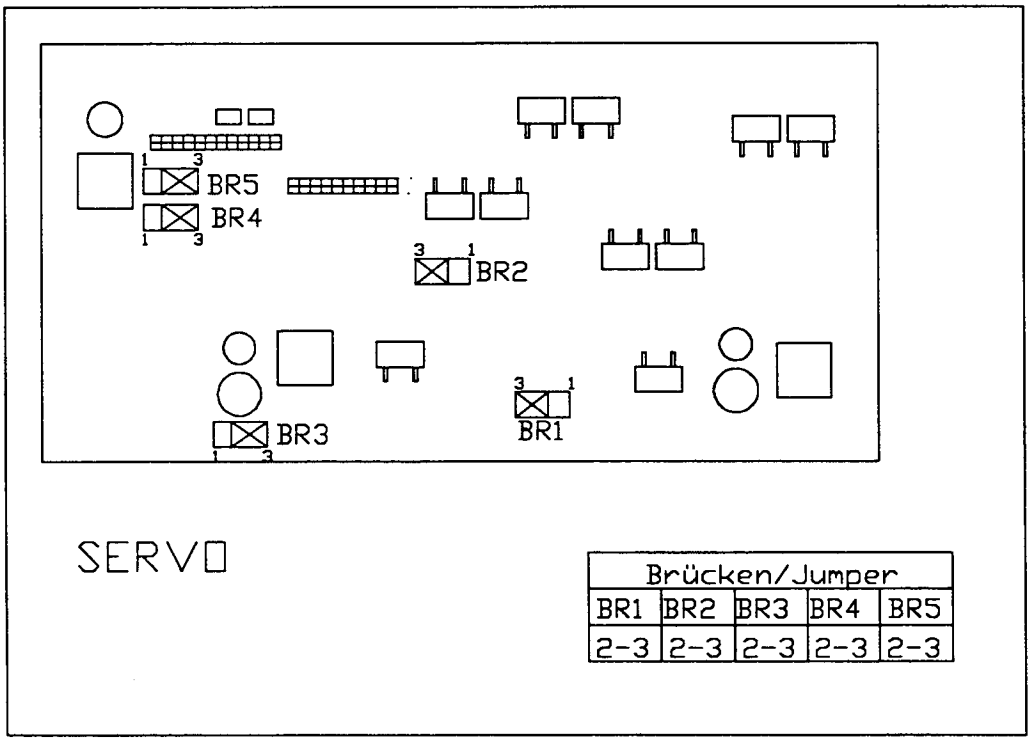
Remove 2 screws with washers (5), and take out function display (6).

Assembly:
Align LEDs with display window.





Brücken/Jumper				
BR1	BR2	BR3	BR5	BR7
1-2	1-2	2-3	2-3	2-3



Brücken/Jumper				
BR1	BR2	BR3	BR4	BR5
2-3	2-3	2-3	2-3	2-3

Inspection procedure

	Chapter/Page
Inspection procedure	12-1 - 12-4
Test report	12-5 - 12-6

Test procedure for M680 surgical microscope

Set instrument up ready for use

- Fit swingarm, control unit, tilt/swivel carrier and operating microscope on rollable floor stand or on ceiling mount in accordance with user manual
- Connect swingarm cable to control unit
- Connect microscope carrier cable to swingarm
- Connect optics carrier cable to swingarm
- Connect footswitch or handswitch to control unit (Control A ● red)
- Connect footswitch or handswitch to control unit (Control B ▲ blue)
- Connect power cable
- Power ON (ON-OFF key shines)
  -Zoom ● (red) and ▲ (blue) travel to their basic position "9" (LEDs on control panel)
  -Internal focus ●(red) and ▲(blue) travel to their basic positions
  -LEDs ● (red) and ▲ (blue) on control panel, for master display, do not shine.

1. Lamp control:

1.1 Quick-change lamp mount is engaged, LED on control panel does not shine.

1.2 Turn LAMP brightness regulator on control unit from Min. to Max.
Microscope lamp can be continuously adjusted (inspect both lamps).

1.3 Disengage quick-change lamp mount. LED on control panel flashes.
Engage quick-change lamp mount and inspect function "Monitoring spare bulb".
If the spare bulb is missing or defective, the pilot lamp on the control panel shines.

2. Zoom control red ● :

2.1 Set selector knob (1-2) on control unit to 1, Master-function (Z) neutral.
The footswitch or handswitch governs Zoom red ● through Control A ● red.

2.2 Turn ZOOM SPEED ● on control unit to + (Max.).
Activate zoom ● and travel to maximum and minimum zoom positions (25 and 5 respectively).
Zoom runs smoothly in both directions.

2.3 Throughput time at maximum ZOOM SPEED:
From V=5x to V=25x = 3 seconds
From V=25x to V=5x = 3 seconds

2.4 Turn ZOOM SPEED ● on control unit to - (Min.).
Activate zoom ● and travel to maximum and minimum zoom positions (25 and 5 respectively).
Zoom runs smoothly in both directions.

2.5 Throughput time at minimum ZOOM SPEED:
From V=5x to V=25x = 6 seconds
From V=25x to V=5x = 7 seconds.

2.6 Arrangement of footswitch or handswitch when microscope is turned:
Set selector knob (1-2) on control unit to 2.
Using footswitch or handswitch ●, go to zoom. Zoom ▲ travels.

2.7 Set selector knob (1-2) on control unit to 1.
Activate "Z" key on control panel until LED of master ● shines.
Activate ● with footswitch or handswitch. Zoom ▲ travels together with zoom ● .

3. Zoom control blue ▲ :

3.1 Set selector knob (1-2) on control unit to 1, Master-function (Z) neutral.
The footswitch or handswitch governs Zoom blue ▲ through Control B ▲ blue.

3.2 Turn ZOOM SPEED ▲ on control unit to + (Max.).
Activate zoom ▲ and travel to maximum and minimum zoom positions (25 and 5 respectively).
Zoom runs smoothly in both directions.

3.3 Throughput time at maximum ZOOM SPEED:
From V=5x to V=25x = 3 seconds
From V=25x to V=5x = 3 seconds.

3.4 Turn ZOOM SPEED ▲ on control unit to - (Min.).
Activate zoom ▲ and travel to maximum and minimum zoom positions (25 and 5 respectively).
Zoom runs smoothly in both directions.

3.5 Throughput time at minimum ZOOM SPEED:
From V=5x to V=25x = 6 seconds
From V=25x to V=5x = 7 seconds.

3.6 Arrangement of footswitch or handswitch when microscope is turned:
Set selector knob (1-2) on control unit to 2.
Using footswitch or handswitch ▲, go to zoom. Zoom ● travels.

3.7 Set selector knob (1-2) on control unit to 1.
Activate "Z" key on control panel until LED of master shines.
Activate ▲ with footswitch or handswitch. Zoom ● travels together with zoom ▲.

4. Focus control ● :

4.1 Set selector knob (1-2) on control unit to 1, Master-function (Z) neutral.
The footswitch or handswitch governs Focus red ● through Control A ● red.

4.2 Turn FOCUS SPEED to Max. and set zoom to 9. Activate internal focus .
Internal focus ● turns smoothly in both directions.

4.3 Turn FOCUS SPEED to Min. and set zoom to 9.
Activate internal focus ●. Internal focus turns smoothly in both directions.

4.4 Press key F (Reset) on control panel. Internal focus ● and ▲ travel to the basic position.

4.5 Throughput time of optical wedges when turned through 180 at maximum FOCUS SPEED:
(Reference, control foil on optical wedge ●.
At zoom position V=5x = 4 seconds
At zoom position V=25x = 8 seconds

4.6 Throughput time of optical wedges when turned through 180 at minimum FOCUS SPEED:
(Reference, control foil on optical wedge ●.
At zoom position V=5x = 12 seconds
At zoom position V=25x = 24 seconds

4.7 Setting of footswitch or handswitch when microscope is turned:
Set selector knob (1-2) on control unit to 2.
Using footswitch or handswitch ●, go to internal focus ▲.

5. Focus control ▲:

5.1 Set selector knob (1-2) on control unit to 1, Master-function (Z) neutral.
The footswitch or handswitch governs Focus blue ▲ through Control B ▲ blue.

5.2 Turn FOCUS SPEED to Max. and set zoom to 9.
Activate internal focus ▲. Internal focus turns smoothly in both directions.

5.3 Turn FOCUS SPEED to Min. and set zoom to 9.
Activate internal focus ▲. Internal focus turns smoothly in both directions.

5.4 Press key F (Reset) on control panel.
Internal focus ● and ▲ travel to the basic position.

5.5 Throughput time of optical wedges when turned through 180 at maximum FOCUS SPEED:
(Reference, control foil on optical wedge ▲)
At zoom position V=5x = 4 seconds
At zoom position V=25x = 8 seconds.

5.6 Throughput time of optical wedges when turned through 180 at minimum FOCUS SPEED:
(Reference, control foil on optical wedge ▲)
At zoom position V=5x = 12 seconds
At zoom position V=25x = 24 seconds.

5.7 Setting of footswitch or handswitch when microscope is turned.
Set selector knob (1-2) on control unit to 2.
Using footswitch or handswitch ▲, go to internal focus ●.

6. XY-gear control, user side ● (tilt)

6.1 Set rotatable joint on optics carrier to position 1.
Using footswitch or handswitch ●, activate tilt carrier from user side ● .
Activate function ↑. Tilt carrier travels away from observer.
Activate function ↓. Tilt carrier travels towards observer.

7. XY-gear control, user side ▲ (tilt)

7.1 Set rotatable joint on optics carrier to position 1.
Using footswitch or handswitch ▲, activate tilt carrier from user side ▲.
Activate function ↑. Tilt carrier travels away from observer.
Activate function ↓. Tilt carrier travels towards observer.

8. XY-gear control, user side ● (swivel)

8.1 Set rotatable joint on optics carrier to position 1.
Using footswitch or handswitch ●, activate swivel carrier from user side ●.
Activate function →. Swivel carrier travels to the right.
Activate function ←. Swivel carrier travels to the left.

9. XY-gear control, user side ▲ (swivel)

9.1 Set rotatable joint on optics carrier to position 1.
Using footswitch or handswitch ▲, activate swivel carrier from user side ▲.
Activate function →. Swivel carrier travels to the right.
Activate function ←. Swivel carrier travels to the left.

10. Adjustment knob XY-SPEED

10.1 Activate ↓, ↑, →, ← functions.
Turn XY-SPEED from - (Min.) to + (Max.).
The adjustment speed of the tilt and swivel carrier (XY gear) is continuously adjustable in both directions.

The XY gear can always be activated from the footswitch or handswitch ● or ▲, without special setting.

Test report for M680 surgical microskope

Costomer: _____

Tested by: _____

Date: _____

M680 components

Description:	Serial no.:	Quantity:
Optics carrier M680	.....	.....
Microscope carrier MSV138		.....
Swingarm MSV136 / MSV167		.....
Control unit MEL61 / MEL62	.....	.....
Footswitch MFS8	.....	.....
Handswitch MEL56	.....	.....
Stereo module long MTU139		.....
Stereo module short MTU140		.....
Tube adapter MTU150		.....
Tube MTU.....		.....
Objective f=		.....

Other accessories: _____

_____

_____

1.	**Lamp control:**		**Note:**		
1.1	Lamp inspection (LED)				
1.2	LAMP brightness regulator				
1.3	Quick-change lamp mount				
	Monitoring spare bulb				
2.	**Zoom control ● :**		**3.**	Zoom control ▲ :	
2.1	Governing zoom red ●		3.1	Governing zoom blue ▲	
2.2	Zoom sequence at max. ZOOM SPEED		3.2	Zoom sequence at max. ZOOM SPEED	
2.3	Throughput time from zoom setting V=5x - V=25x	.....sec.	3.3	Throughput time from zoom setting V=5x - V=25x	.....sec.
	Throughput time from zoom setting V=25x - V=5x	.....sec.		Throughput time from zoom setting V=25x - V=5x	.....sec.
2.4	Zoom sequence at min. ZOOM SPEED		3.4	Zoom sequence at min. ZOOM SPEED	
2.5	Throughput time from zoom setting V=5x - V=25x	.....sec.	3.5	Throughput time from zoom setting V=5x - V=25x	.....sec.
	Throughput time from zoom setting V=5x - V=25x	.....sec.		Throughput time from zoom setting V=25x - V=5x	.....sec.
2.6	Arrangement of footswitch or handswitch (2)		3.6	Arrangement of footswitch or handswitch (2)	
2.7	MASTER function ● "Z" key		3.7	MASTER function ▲ "Z" key	
4.	**Fokus control ●:**		**5.**	**Focus control ▲:**	
4.1	Governing fokus ●		5.1	Governing focus ▲	
4.2	Focus sequence at max. FOCUS SPEED		5.2	Focus sequence at Max. FOCUS SPEED	
4.3	Internal focus ● turns smoothly		5.3	Internal focus ▲ turns smoothly	
4.4	"F" focus basic position ● and ▲		5.4	"F" focus basic position ● and ▲	
4.5	Throughtput time at max. FOCUS SPEED/V=5x	.....sec.	5.5	Throughtput time at max. FOCUS SPEED/V=5x	.....sec.
	Throughtput time at max. max. FOCUS SPEED/V=25x	.....sec.		Throughtput time at max. FOCUS SPEED/V=25x	.....sec.
4.6	Throughtput time at min. FOCUS SPEED/V=5x	.....sec.	5.6	Throughtput time at min. FOCUS SPEED/V=5x	.....sec.
	Throughtput time at min. FOCUS SPEED/V=25x	.....sec.		Throughtput time at min. FOCUS SPEED/V=25x	.....sec.
4.7	Arrangement of footswitch or handswitch (2)		5.7	Arrangement of footswitch or handswitch (2)	
6.	**XY-gear control, tilt ●:**		**7.**	**XY-gear control, tilt ▲:**	
6.1	Function ↑		7.1	Function ↑	
	Function ↓			Function ↓	
8.	**XY-gear control, swivel ●:**		**9.**	**XY-gear control, swivel ▲:**	
8.1	Function →		9.1	Function Ä	
	Function ←			Function î	
10.	**Adjustment knob XY-SPEED**				
10.1	Adjustment speed				

M680 service courses

Content:

Assembling the microscope on the floor stand
Exchanging modules and boards
Replacing the gas spring in the swingar
Using the test box to locate faults

Goals:

After the course, the participant should be able to

- install the instrument ready for use
- use the test box to locate faults
- exchange modules and boards in accordance with the instructions
- carry out a comprehensive inspection of the functions

Location:

Leica AG, Heerbrugg, Service S+PS/MSM training department

In agencies, provided that the service technician has alredy attended an M680 course at Leica AG

Duration:

3 days

Cost:

In accordance with present guidelines, SFr. 250.-- per day excluding travel and accomodation

Technical Requirements:

Basic knowledge of mechanical engineering and of measuring technique

Number of participants:

Individuell

Remarks:

Send application to agency

Test set M695/M680 - stock no. 566 152

Contents of test set

- Test box, stock no. 566 146
- Service cable M695/M680, stock no. 566 148
- Service handswitch, stock no. 566 147

Enables defective assemblies to be identified

- Foot- or handswitch
- Swingarm
- Control unit MEL61/62
- X- or Y-gear MSV138
- M695/M680 microscope

Procedure for fault location
See section 4

1. Introduce the test box between the swingarm and the microscope - Plug connections JP36 and JP37.
2. Inspect the voltages and currents of the POWER SUPPLY as described in Section 4.

Cause in footswitch?

3. Substitute service handswitch for footswitch, observe signal voltages, and also monitor LEDs on control unit.
4. Observe the signal voltages of the defective function (MICROSCOPE CONTROL or XY-gear) - as described in Section 4.

Cause in microscope or in XY-gear?

5. Separate the microscope or the XY-gear, as appropriate, from the test box, and observe the signal voltages which flow from the control unit through the swingarm.

Cause in control unit or swingarm?

6. Use service cable to bridge swingarm, and observe signal voltages from control unit.

Functions of test box

All control voltages ...

All supply- and control voltages between the control unit MEL61/62 and the microscope with XY-gear can be measured.

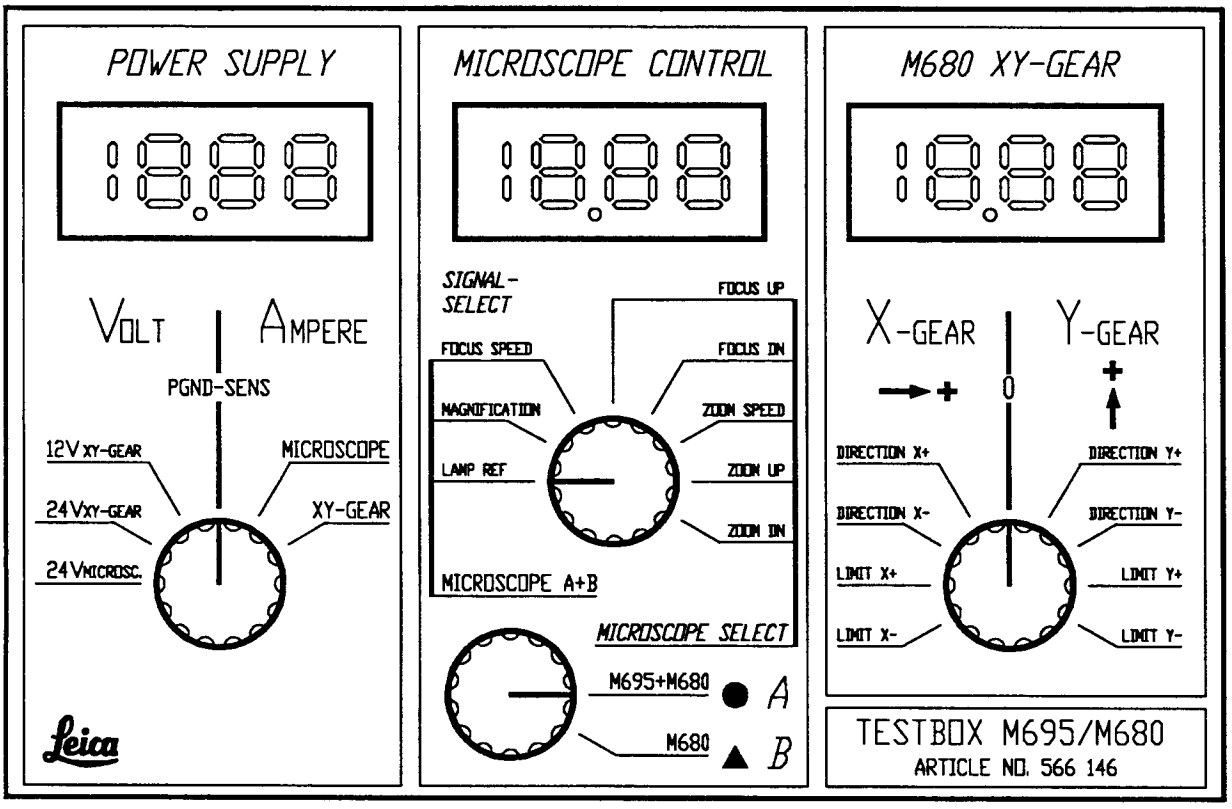
... to the microscope ...

Control voltages to the microscope are measured relative to XY_GND, such to the XY-gear relative to GND_XY.

... measure at low light level

Unless otherwise indicated, set the lamp to minimum brightness. The voltages indicated in Section 4 are only valid for this condition.

Voltage levels are falsified by the voltage drop between the control unit and the microscope. Because of the current taken by the lamp, this voltage drop to PGND (measuring ground) can be as much as 0.6V. The control voltages of focus and zoom are measured against PGND and are therefore influenced.



S1 S3 S2 S4

The test box: three multimeters

One digital voltmeter is assigned to each of the functions POWER SUPPLY, MICROSCOPE CONTROL and XY-GEAR. The signals reach the measuring instrument through a rotary switch.

Digital voltmeters

Range of measurement: 1.999V - with overflow display (OL)

Measurement precision: 1% +-1 digit, 2 measurements/second

Auxiliary voltage: 7 - 15VDC

Supply for digital voltmeter
Circuit diagram on page 18-5

The power is derived from the 24V supply of the XY-gear. Three galvanically-separating DC converters each reduce the voltage to approx. 12V each.

Rotary switch S1: Displaces the decimal point on the display by one digit to the right for the 24V - measuring ranges.

POWER SUPPLY
Diagram on page 18-6

Rotary switch S1: Level 1 ... Selects current- and voltage ranges.

Voltage distributor: 1/10 for 12V range
1/100 for 24V ranges

Current measurement range: Voltage drop across 0.1 ohm resistor.

Measuring ground: **PGND** - $24V_{MICROSCOPE}$
SENS - PGND
GND-XY - 12V / $24V_{XY\text{-}GEAR}$

MICROSCOPE CONTROL
Diagram on page 18-7

Rotary switch S3: Selects those signals which are assignable either to microscope A or to microscope B.

Rotary switch S2: Selects the control signals to and from the microscope.

Voltage distributor: 1/10

Measuring ground: **SENS**

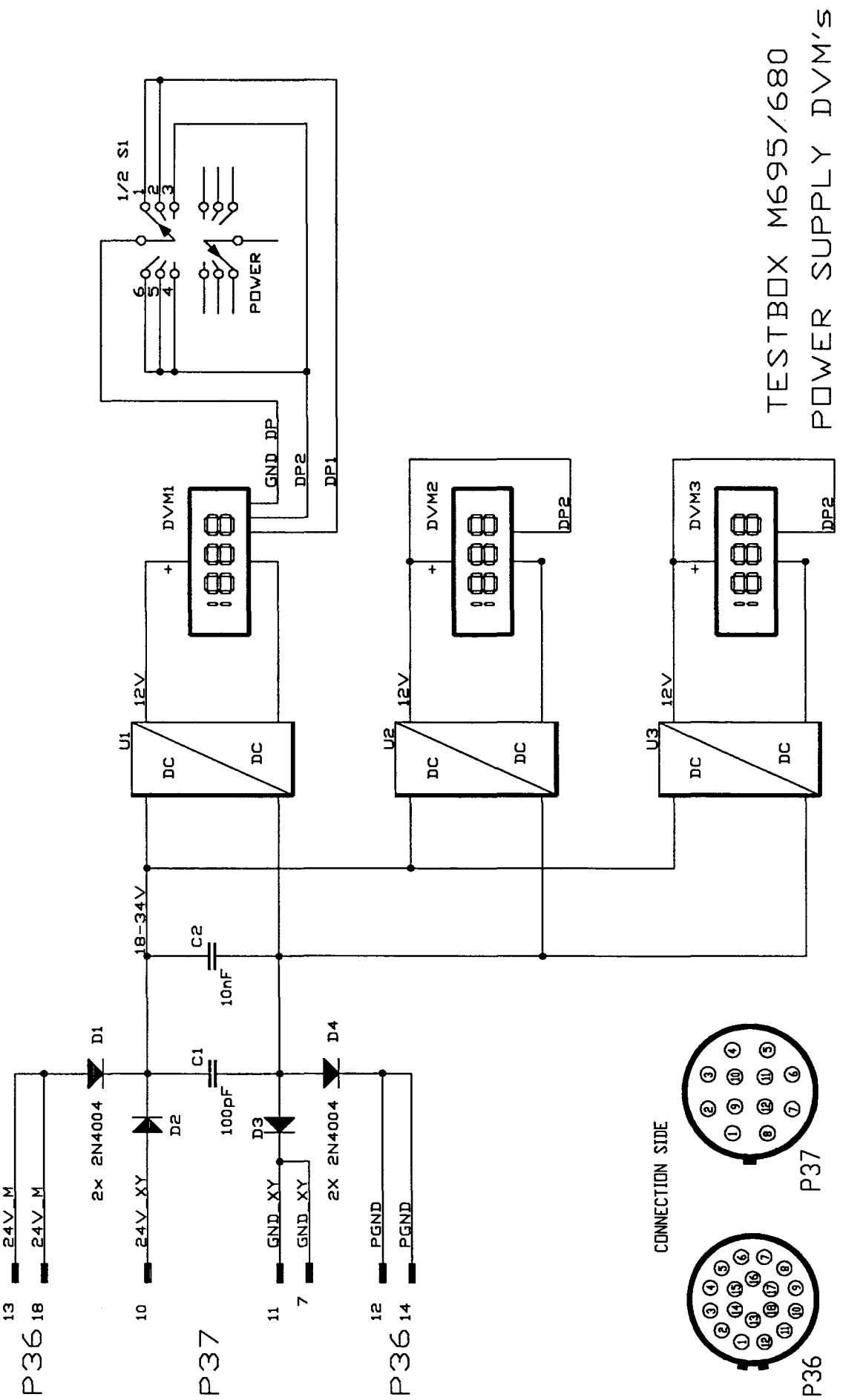
XY-GEAR

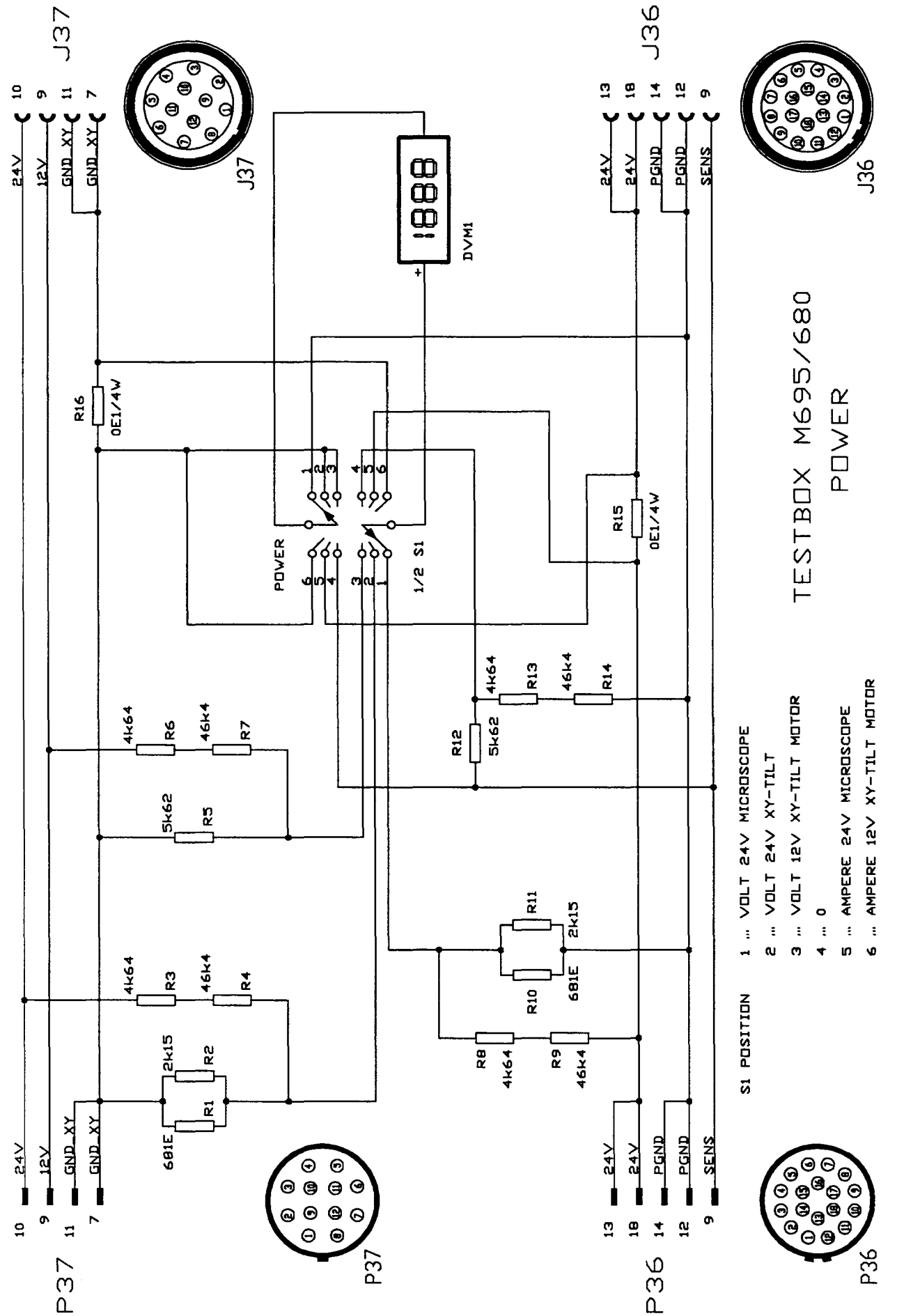
Diagram on page 18-8

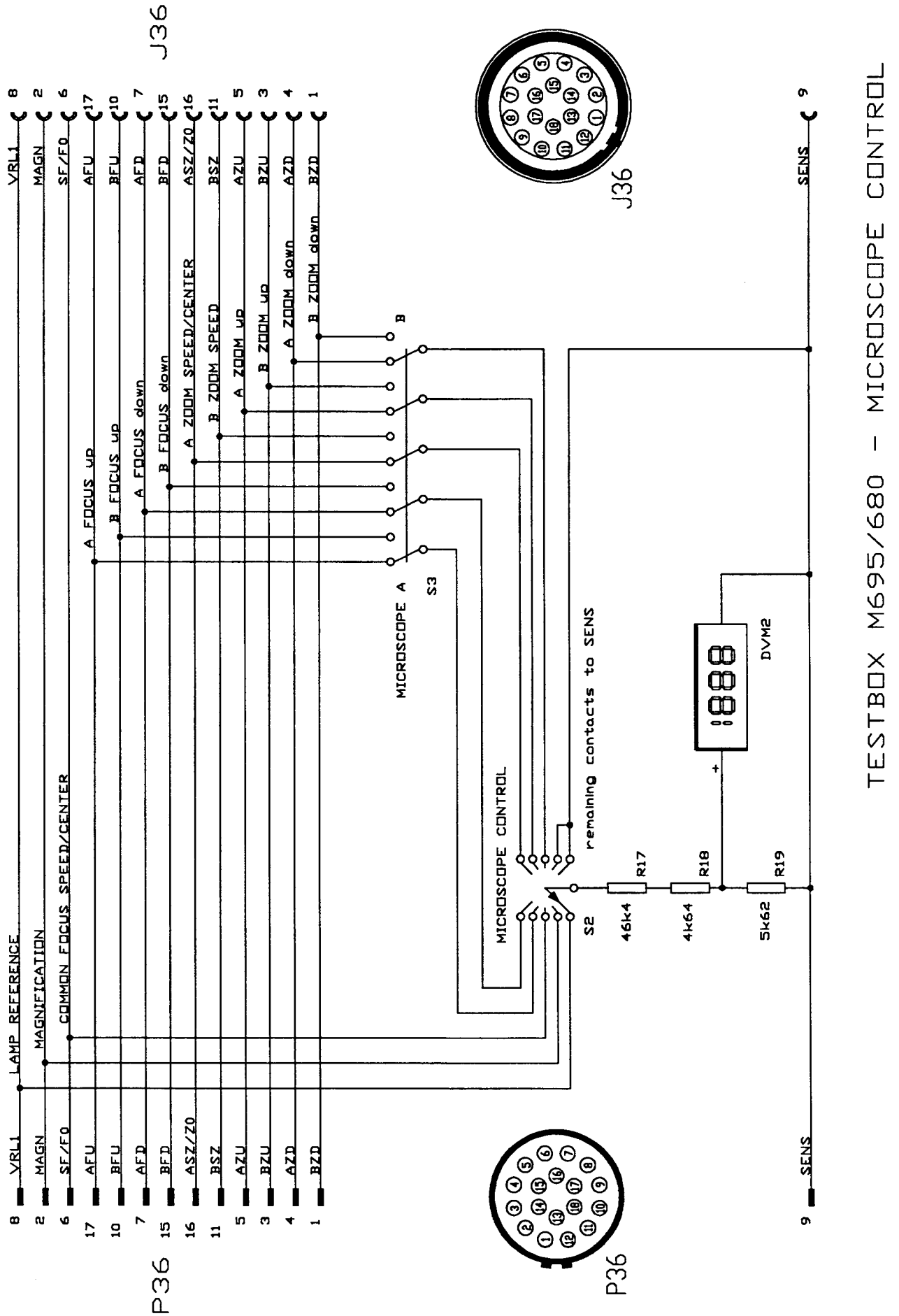
Rotary switch S4:	Selects the signals from and to XY-GEAR.
Voltage distributor:	1/10
Measuring ground:	**GND_XY**

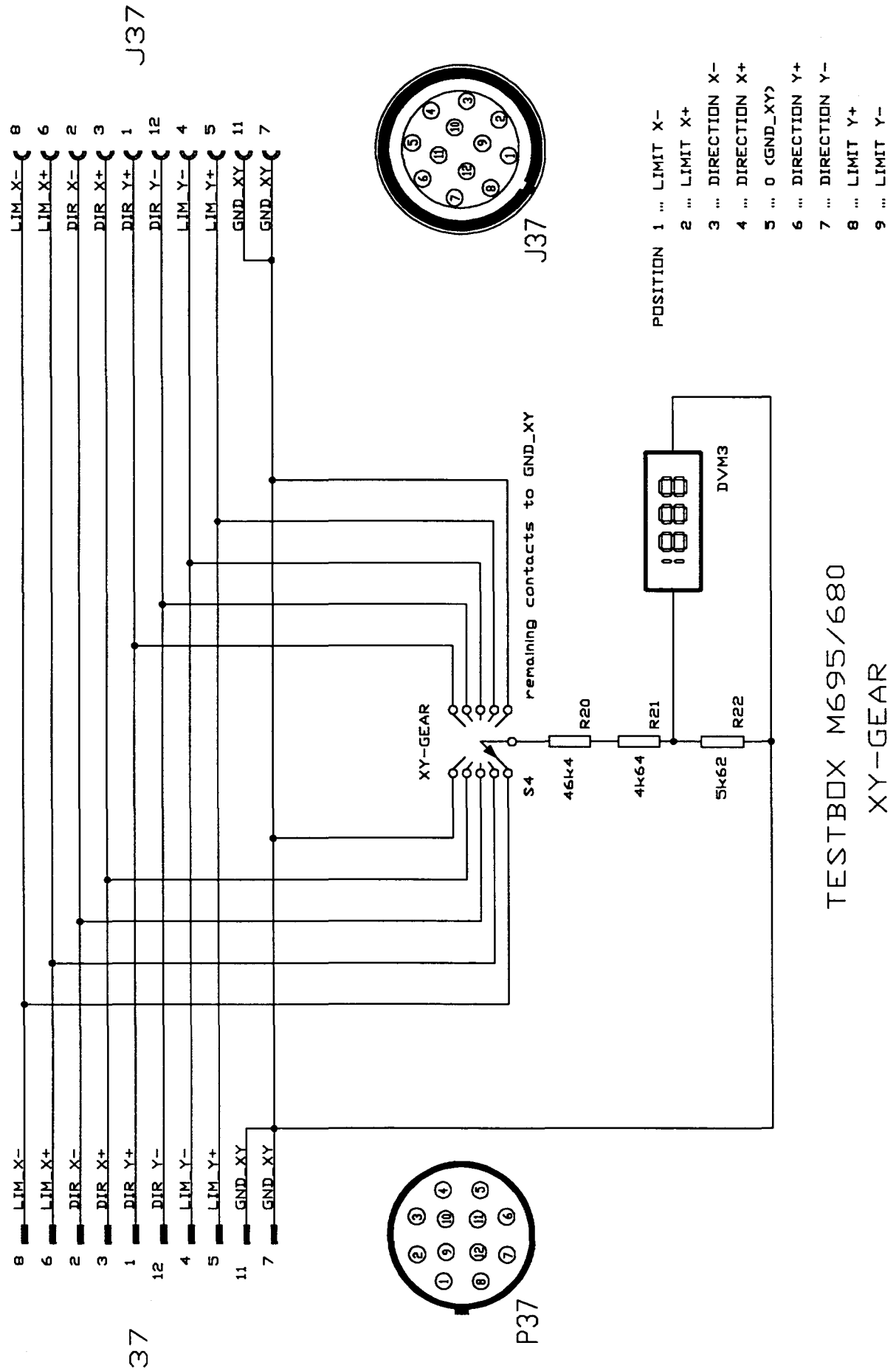
Specifications:

Voltage measurement:	+-3% +-1 digit
Current measurement:	+-5% +-1 digit


TESTBOX M695/680
POWER SUPPLY DVM's
1/2 S1
POWER
GND DP
DP2
DP1
DVM1
DVM2
DVM3
12V
U1
U2
U3
DC
18-34V
C2
10nF
C1
100pF
D1
D2
D3
D4
2x 2N4004
2X 2N4004
24V_M
24V_XY
GND_XY
PGND
P36
P37
CONNECTION SIDE


TESTBOX M695/680
POWER
J37
J36
P37
P36
DVM1
1888
POWER
1/2 S1
R16 0E1/4W
R15 0E1/4W
R1 681E
R2 2k15
R3 4k64
R4 46k4
R5 5k62
R6 4k64
R7 46k4
R8 4k64
R9 46k4
R10 681E
R11 2k15
R12 5k62
R13 4k64
R14 46k4
24V
12V
GND_XY
PGND
SENS
S1 POSITION
1 ... VOLT 24V MICROSCOPE
2 ... VOLT 24V XY-TILT
3 ... VOLT 12V XY-TILT MOTOR
4 ... 0
5 ... AMPERE 24V MICROSCOPE
6 ... AMPERE 12V XY-TILT MOTOR

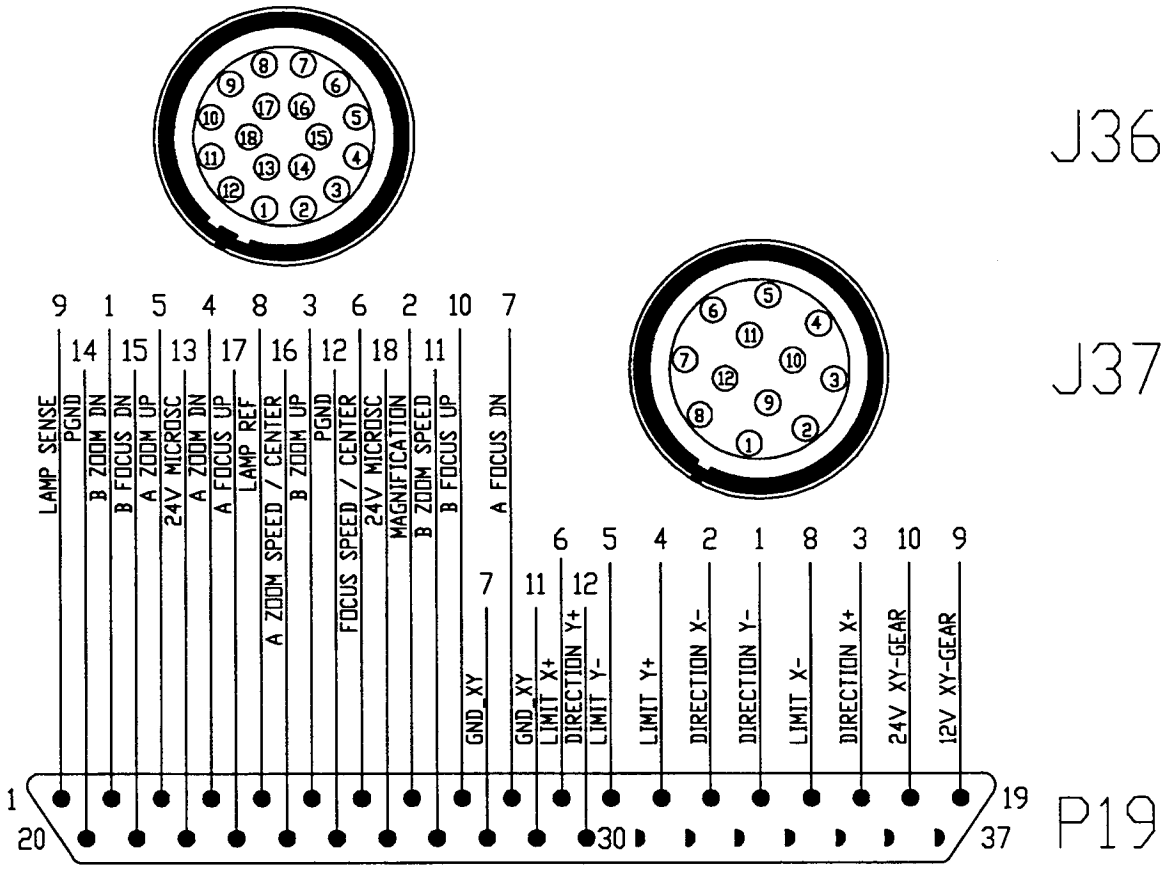

TESTBOX M695/680 - MICROSCOPE CONTROL
J36
P36
VRL1
MAGN
SF/FO
AFU
BFU
AFD
BFD
ASZ/ZO
BSZ
AZU
BZU
AZD
BZD
LAMP REFERENCE
MAGNIFICATION
COMMON FOCUS SPEED/CENTER
A FOCUS up
B FOCUS up
A FOCUS down
B FOCUS down
A ZOOM SPEED/CENTER
B ZOOM SPEED
A ZOOM up
B ZOOM up
A ZOOM down
B ZOOM down
SENS
MICROSCOPE A
S3
MICROSCOPE CONTROL
remaining contacts to SENS
S2
R17
R18
R19
46k4
4k64
5k62
DVM2


J37
LIM_X- 8
LIM_X+ 6
DIR_X- 2
DIR_X+ 3
DIR_Y+ 1
DIR_Y- 12
LIM_Y- 4
LIM_Y+ 5
GND_XY 11
GND_XY 7
J37
POSITION 1 ... LIMIT X-
2 ... LIMIT X+
3 ... DIRECTION X-
4 ... DIRECTION X+
5 ... 0 (GND_XY)
6 ... DIRECTION Y+
7 ... DIRECTION Y-
8 ... LIMIT Y+
9 ... LIMIT Y-
remaining contacts to GND_XY
XY-GEAR
S4
R20
46k4
R21
4k64
R22
5k62
DVM3
TESTBOX M695/680
XY-GEAR
P37
P37

Service cable M695 / M680

for bridging the swingarm

The service cable enables you to say whether the fault is in the control unit or in the swingarm.



Spare parts catalogue

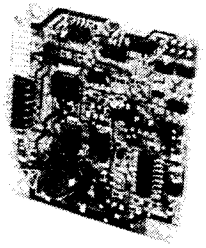
	Chapter/Page
Optics carrier M680	19-1 - 19-4
XY-Gear MSV138	19-4 - 19-5
Control unit MEL61/62	19-6 - 19-7
Swing arm MSV136/167	19-7

STOCK Nº	DESCRIPTION, SPECIFICATION, REMARK	DRAWING

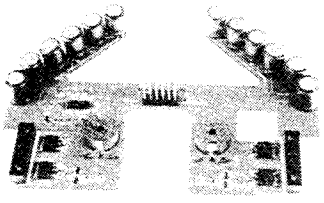
Optics carrier M680

355 940 Focus servo

355 960 Zoom servo

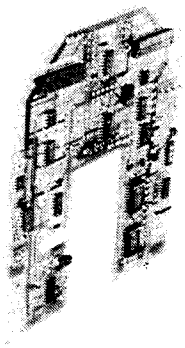


634 680 Lamp control 21 (replacement for Lamp control 2)

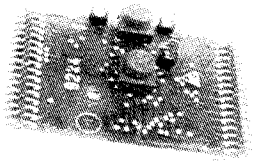


STOCK Nº	DESCRIPTION, SPECIFICATION, REMARK	DRAWING

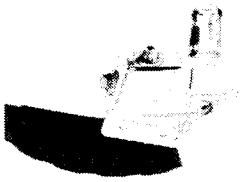
370 040 Logic board



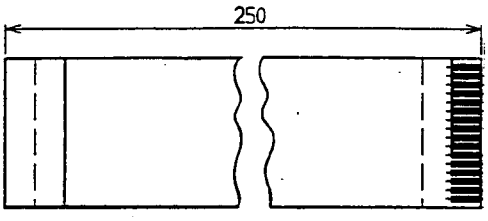
370 060 Select board



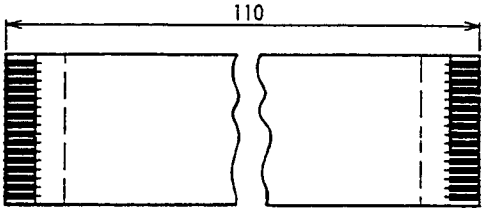
445 334 Light bulb, complete assembly



560 356 Ribbon cable 1

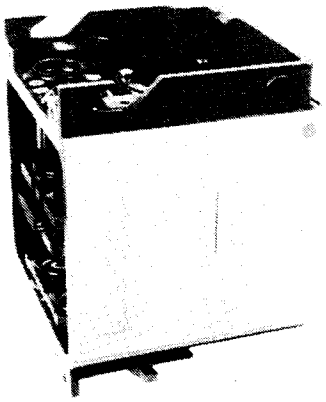


560 357 Ribbon cable 3

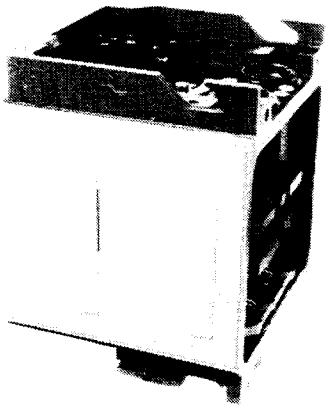


STOCK Nº	DESCRIPTION, SPECIFICATION, REMARK	DRAWING

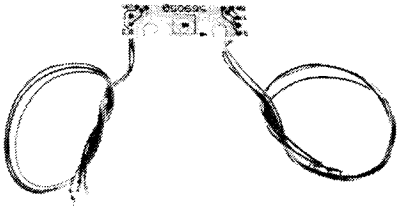
565 433 Optics carrier (red) ●



565 434 Optics carrier (blue) ▲

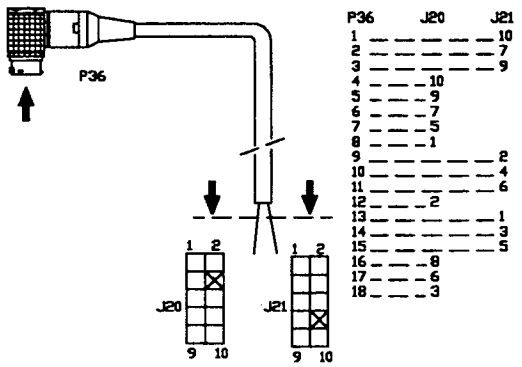


569 050 Sensor board



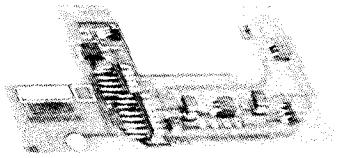
STOCK Nº	DESCRIPTION, SPECIFICATION, REMARK	DRAWING

635 856 Cable, Microscope to swing arm

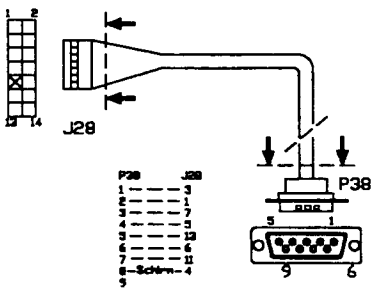


XY-Gear MSV138

561 810 Limit board (Y)

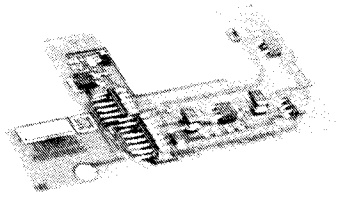


564 923 Pivot cable

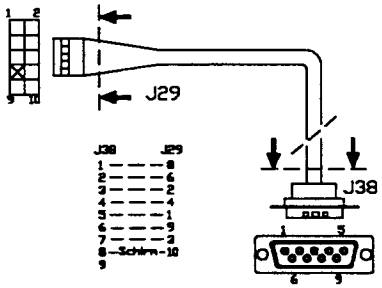


STOCK Nº	DESCRIPTION, SPECIFICATION, REMARK	DRAWING

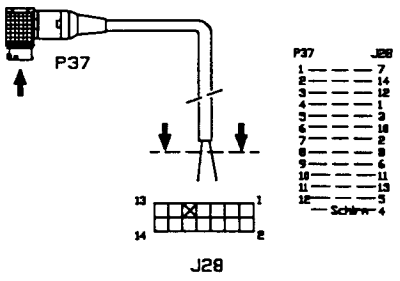
634 320 Limit board (X)



635 857 Tilt cable



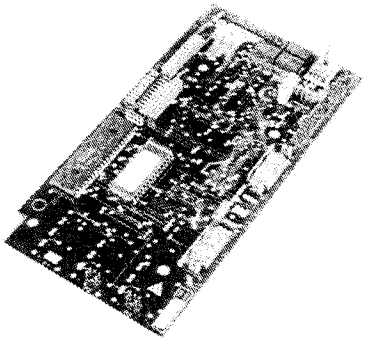
635 858 Cable, microscope carrier to swing-arm



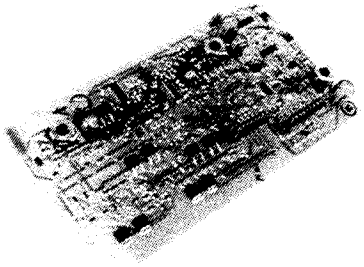
STOCK Nº	DESCRIPTION, SPECIFICATION, REMARK	DRAWING

Control unit MEL61/62

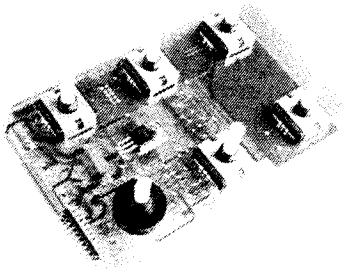
635 972 Receiver board HW+SW



635 973 Servo board

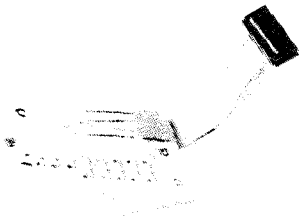


567 930 Panel board



STOCK Nº	DESCRIPTION, SPECIFICATION, REMARK	DRAWING

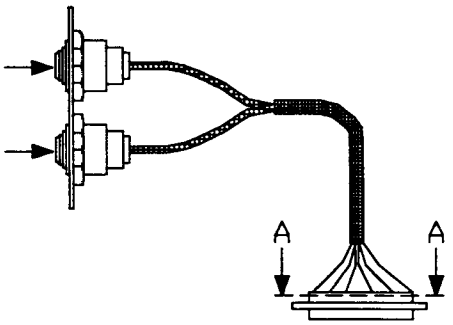
526 770 Function display



Swing arm MSV136/167

433 826 Gas spring

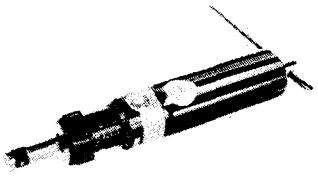
635 859 Pivot cable



Special tools

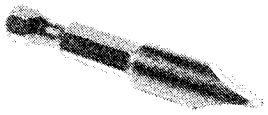
401 283 Pin spanner

418 135 Handle for pin spanner

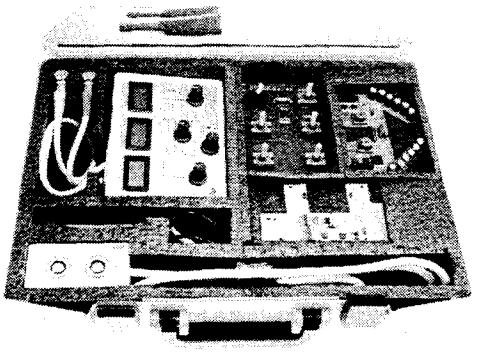


520 718 Torque wrench

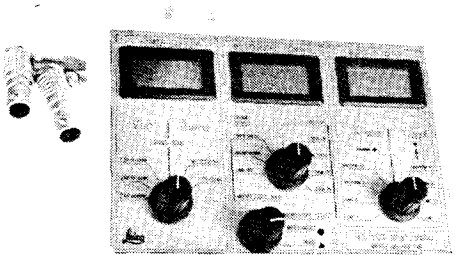
529 129 Allen insert for 520 718



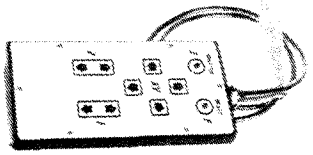
529 154 Slot blade for 520 718



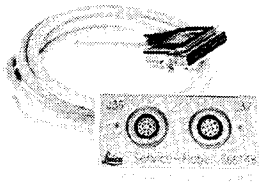
566 152 Test set compl. *without boards*



566 146 Test box



566 147 Hand switch mod.



566 148 Service cable (M680/M695)

566 151 Box